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"Poultry Diseases—An Urgent Veterinary Problem."*

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A recognised authority on commercial poultry raising wrote three years ago that "the foundation for success with poultry is built on perfect health and to this all else is subordinate." The strain of blood in the flock may be valuable, the pedigrees may cover several sheets of paper, the farmer's sideboard may bristle with cups, a ready market for his products may be at his very door, the lay-out of his farm may delight the eye, but none of these things counts for much if disease appears.

Poultry farmers suffer heavier losses from disease in proportion to the capital invested than do other agriculturists. One hears only too commonly of men who have built up flocks with an international reputation being reduced to comparative poverty following outbreaks of diseases such as bacillary white diarrhœa. Big men and little men in the industry endure these ruinous losses, not only because they cannot be prevented but because there are few persons who can tell them how to prevent them. If we ask the average poultry farmer to consult the local veterinary surgeon regarding the prevention of disease, he will reply that the veterinarian knows nothing about poultry. If we ask the practitioner why he does not interest himself in poultry, we will be told that nobody consults him in the matter. The relations between the poultry farmer and the veterinarian appear as a vicious circle. The veterinarian does not qualify himself to advise because the farmer does not consult him and the farmer does not consult the veterinarian because the veterinarian does not qualify himself to advise. Events cannot be allowed to march in this vicious circle indefinitely. One side must move to end a situation which is leading to ever-increasing losses amongst poultry. Let us remember as veterinarians that everything which concerns the health of the lower animals concerns us. Let us look back on the history of our profession and proudly recall the problems that have been solved. Let us turn confidently to face this new problem with the realisation that we have a basic training in the prevention of animal diseases that is unequalled and invaluable.

An urgent veterinary problem presents itself and a careful organisation seems necessary if it is to be solved. Every veterinarian can play his part. Not a day passes that the practitioner does not visit farms where poultry are kept and it is a simple matter to inquire regarding the health of the birds. Often it will be found that serious losses have occurred and an opportunity may be afforded of obtaining some dead birds for examination. The veterinarian may feel very helpless with his first cases, but he should not forget that he has behind him in the British Isles at least four laboratories to which he can send poultry specimens and from which he can receive advice. It may be that he has made a *post-mortem* examination of a carcase himself, and has noted certain abnormalities without diagnosing any specific disease. When he has received the laboratory report he is in a position to collate the expert diagnosis with his own notes. As time goes on it becomes common talk in the neighbourhood that the local veterinarian is interested in poultry and soon may come the red-letter day when the whole-time poultry farmer seeks his help. Every veterinarian should prepare himself for that day by learning the rudiments of poultry husbandry and the main facts regarding the common diseases.

It is always an advantage for a practitioner to be able to discuss general agricultural topics with a client and those who wish to build up a poultry practice will find it useful to know, for example, the various breeds, the hatching seasons for light and heavy breeds, the time of the year when pullets begin to lay and the various systems of farming. As our knowledge increases we shall probably recognise that some of the methods advocated and adopted by prominent poultry men, which will be discussed later, are opposed to hygienic and other principles. We should not hesitate to advise any alternative methods which suggest themselves to us, always provided that they are practical. Poultry problems present an almost virgin field untrodden by other professions and it should be our care that others do not step in where veterinarians hesitate to tread. We must not allow our place to be usurped in poultry matters as has happened in the case of animal nutrition, meat inspection, clean milk and other problems. If we allow advisory or research work regarding poultry hygiene, sanitation, or diseases, to pass to outsiders, we fail in our duty to the profession.

This does not mean that co-operation with others is not desired. On the contrary, it seems that we must look to the various poultry instructors to bring the farmer in touch with the veterinarian. The instructors are daily consulted regarding diseases, and their duty, as I conceive it, is to confine their advice to the small problems and to recommend that the farmers employ the local veterinarian when serious losses are reported. The common practice of poultry instructors carrying out *post-mortem* examinations must be condemned, because they have not and cannot be expected to have the necessary training for such work. It cannot be too much emphasised that the diagnosis of poultry diseases demands a skill not less than that

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required for the recognition of diseases in man and the larger animals. There is a responsibility attached to such work and no lay person can honestly accept that responsibility. In the past there may have been a good reason for laymen attempting to diagnose diseases because there was no one else to do it, but to-day, there are well-equipped laboratories where a reliable opinion can be obtained. It seems to me unfair that anybody should open, say, a chick, make a naked-eye examination and then tell the farmer that there is no evidence of disease simply through ignorance that the most devastating disease of chicks has no characteristic lesions. The poultry keeper rightly respects the opinion of his county instructor and when he is told that there is no disease present, he breathes a sigh of relief and does nothing. Often, later, he breathes a sigh of regret when he realises it is necessary to obtain the report of a qualified person and finds that during the interval bacillary white diarrhœa has ruined his flock.

A careful organisation is necessary. The poultry farmer consults the local veterinarian directly or on the advice of the instructor. The local veterinarian refers the matter in doubtful cases to the laboratory and informs the farmer directly regarding preventive measures. It may be suggested that the poultry instructor should correspond directly with the laboratory but that procedure is not to be favoured because it is necessary in any serious outbreak of disease for a veterinarian to visit the farm and to base his advice on the local conditions. No advisory letter from a laboratory can take account of the special circumstances of each and every case. All that the laboratory worker can do is to indicate the broad principles and leave the detailed plan of campaign to the practitioner. It may be some time before this ideal is reached, but it must come if the problem of poultry diseases is to be solved. Those of us who have any influence with county agricultural authorities, central agricultural bodies, or poultry associations, should endeavour to bring these facts to their notice, even at the risk of being accused of trying to build up an organisation which will give us financial benefit.

That opens another question. The obligations to undertake this work which attach to us as veterinarians have been discussed, but sometimes it happens that in meeting our moral obligations, we cannot meet our creditors. We cannot be expected to do this work just for the love of the thing or even for the love of our profession. Is there any money in this business? Can the poultry farm pay?

In answering these questions one is always faced with the fact that most fowls are worth only a few shillings each and that there is always the domestic hatchet to cure all ills. The farmer's wife who keeps a few mongrel birds running around the yard will not pay, because usually the fowl are low producers. They have not been selected or bred for winter or any other egg production and they can be easily replaced. If they become ill, the drop in the already low egg yield is not felt and they can always be sold to the "hen-man" or they can be dressed for the local market. But consider the whole or part-time poultry farmer who has capital invested in his business, who has paid high prices for eggs, chicks and foundation stock, who has erected costly plant to accommodate the flock, who works carefully to a timetable throughout the year, as he must do if he is to make a profit, who finds that, if his last hatch of Wyandotte chicks in March dies, he cannot fill the orders of his customers for day-old chicks or, if he intended to keep the chicks himself, that he will not have the valuable winter eggs. Can we doubt that such a man will pay who knows very well the disasters which have overtaken others and who, all the time, is working on a narrow margin of profit? Can we doubt that, if he has, say, five hundred pounds invested, a small capital for a poultry farm, he can afford a veterinary fee? Every week the poultry press tells the farmers that, if they have even a single carrier of bacillary white diarrhœa in their breeding stock, all the chicks hatched from the stock may die. Will the amount of a veterinary fee frighten a farmer when so much is at stake? Poultry keepers are expending large sums on having the agglutination test for bacillary white diarrhœa applied to their stock. The demands on veterinary laboratories to carry out the test are so heavy that it has been found necessary to refuse a large number of tests. The collection of blood samples by veterinarians in this one disease alone should account for good fees. At the last Annual Congress of our parent Association, Professor De Blieck, of Holland, informed his audience that three hundred and fifty out of five hundred practitioners in his country carried out vaccination of poultry. Several veterinarians told me the same thing when I was on the Continent in 1925 and some were candid enough to say that if it were not for the work they would fare badly. Why the difference between this country and Holland? The individual bird is not more valuable there than here. The capital value and turn-over of our poultry industry is greater than that of the Dutch. The fact of the matter is that we have not realised the magnitude of the industry. Too many of us think of the barn-door fowl and forget or never know the rest.

It was suggested earlier in the paper that as experience increases it may be recognised that certain methods of poultry husbandry transgress hygienic and other principles. It is difficult to escape from the view that many of the troubles of the poultry farmer are due to lack of moderation. Birds are expected to produce an egg at least every second day in the year and are forced to lay right up to the time they are put in the breeding pens and still the farmer wants to know why the eggs are not hatchable and the chicks not rearable. The geneticist may invoke lethal factors or the pathologist may incriminate *Bacillus pullorum* or *Eimeria avium*, but let us recognise that very often the predisposing cause is overproduction of eggs. Male birds are not over-used lest they become sterile but nobody bothers about the female; she is expected to produce ova day after day and always to be fertile.

Other things being equal, the risk of contagious disease is directly proportional to the size of the unit. If does not need any special knowledge to recognise that, if two thousand chicks or five hundred adults are kept together in one house, a common occurrence, any contagious disease which appears can spread rapidly. One can go any day to poultry farms where bacillary white diarrhœa and roup are devastating the flocks and find that no attempt is being made to divide the stock into smaller units. Of course, large units save labour, but it is very doubtful, quite apart from the risk of disease, if birds do as well in large units. In seems that we are on safe ground in advising the small unit.

We can also confidently make out a case against modern methods of feeding. Some of the most important diseases of birds are spread by the droppings and we can legitimately take exception to the common practice of allowing dry mash to be before the birds continuously. If we go into any brooder house where dry mash is fed, we find that the troughs contain a mixture of food and droppings, a dangerous ration for the healthy bird. How much better is the wet mash system where the birds finish their meal within half-an-hour, after which time the troughs are removed and cleaned and where the sick bird is hustled away from the trough by its vigorous neighbours and thus has little opportunity of infecting the food. The substitution of wet-mash for dry-mash feeding involves no sacrifice but rather a gain for, as in the case of the small unit, the birds do better.

One would like very much to persuade farmers that great risk attaches to the feeding of grain in the litter, but the difficulty of providing an alternative method of obtaining exercise has to be overcome. The poultry keeper does not believe in renewing the bedding any oftener than he can help and he sees no harm, even when disease appears, in burying the grain amongst the droppings on the floor. Some go as far as to collect the droppings in pits under the perches, but the latter method is fortunately going out of fashion since its inventor suffered heavy losses from roup.

Every farmer knows that disinfection is necessary but few know how or when to carry it out. There are those who rely on whitewash, those who timidly burn sulphur candles with the windows open, those who deluge the plant with disinfectant and immediately wash it out, those who treat the birds for red mite during the day while these nocturnal parasites are resting in the house. These people are wasting time and money.

Only a very short experience of poultry farmers is needed to make one realise that they know little of even the most elementary points of management in relation to disease. Adult turkeys harbour, without apparent inconvenience, the causal nematode worm of gapes, a serious disease of chicks, but turkeys are often allowed to run with chicks. Blackhead is the great obstacle to turkey rearing. Adult turkeys suffer from a chronic form of the disease and are the chief source of infection for the young birds. Turkey chicks can be easily hatched out under ordinary hens or in incubators, but very few employ these safe methods. Tuberculosis is an important cause of loss amongst fowl on general farms and its ravages can be greatly reduced by culling birds after their second season; yet this is not done although it should be well known that hens cease to be profitable after two years of age. Many other points of management might be discussed but sufficient indication has been given that the poultry keeper needs guidance by us in the very elements of his business if he is to escape from the crushing burden which disease at present imposes upon him.

So far we have discussed generalities and it is now necessary to give a brief account of the chief diseases of domesticated birds in the British Isles. Bacillary white diarrhœa is probably responsible for more losses than all other diseases combined. Ten thousand chicks is not an unusual loss on a large farm. The disease runs an acute course in chicks and a chronic course in adults. The causal organism is *Bacillus pullorum*, a member of the coli-typhosus group. Chicks which survive an outbreak of the disease may, when they reach laying age, produce eggs containing the causal agents. Chicks hatched from such eggs are infected and capable of infecting chicks with which they have direct or indirect contact. Chicks are most susceptible to infection during the first forty-eight hours of life and after a week are comparatively immune to acute infection. The disease is commonly introduced to a farm by the purchase of infected eggs, day-old chicks, or adult "carriers." The cycle of infection may be summarised as follows: The carrier hen lays an infected egg from which hatches an affected chick which survives to become a carrier hen. The droppings of "adult" carriers can act as a source of infection for chicks, but infection does not apparently pass from adult to adult in the absence of a male bird.

When the disease appears amongst chicks, ten to ninety per cent. succumb, seventy per cent. being an average loss. The symptoms during life are characteristic. Affected chicks show drooping wings, ruffled feathers, sleepy appearance, inappetence and a tendency to huddle together near the source of heat. A white or yellowish diarrhœa is almost invariably present which adheres to the vent feathers in varying amount, causing what the poultry keeper calls "pasting-up behind." The eyes are closed a part of the time and the chicks remain in the standing position, often with a swaying movement. The back looks short and the abdomen is prominent behind. Swelling of the feet and lameness are less important symptoms. Deaths may occur in the shell or immediately after hatching and continue for a month or longer. A heavy death rate during the first forty-eight hours usually indicates a high percentage of infected eggs, while a slight early mortality, followed by heavy losses, points to the infection being largely post-natal.

The *post-mortem* appearances are not characteristic and are not to be relied on for diagnosis. The liver is

often grossly enlarged. A mottled appearance of this organ is normal in chicks and has no pathological significance. Usually the yolk, which serves to nourish the bird during the first days of life, is not absorbed but this persistence of the yolk occurs in many diseases. Areas of round cell infiltration may occur in the heart muscle and nodules are commonly present in the lungs. The cæca, which let us remember are two in number in the bird, are frequently distended with a mass of necrotic material. Enteritis is commonly present.

Diagnosis depends on the isolation of *Bacillus pullorum* from the carcase and its recognition by laboratory methods. The organism is most constantly found in the egg-yolk and liver. A high mortality, commencing soon after the chickens are hatched and continuing for some weeks, should, in the absence of obvious mismanagement or of lesions of other diseases, lead one to suspect bacillary white diarrhœa. The only other common specific disease with which it is likely to be confused is coccidiosis, but the latter disease does not usually appear until the birds are at least a fortnight old and the oocysts of the causal protozoan can be readily demonstrated in the fæces or intestinal contents by the usual methods. It is of the greatest importance that a hurried opinion should not be given regarding the presence or absence of bacillary white diarrhœa. The difference between a positive and a negative finding means so much to a farmer that nobody should attempt to advise regarding losses amongst chicks without a careful bacteriological examination of specimens. One has to remember that the so-called normal mortality of the farmer—the ten or fifteen per cent. death rate which he regards as inevitable—is often associated with initial outbreaks of bacillary white diarrhœa. On the other hand, we must recognise that when chicks are brooded in large units, overheating, chilling, and faulty feeding may give rise to symptoms indistinguishable from those of specific disease. When in doubt, play for safety and send chicks to a laboratory.

There is no method of curing affected chicks, nor does this seem desirable, as survivors may become carriers of the disease. Losses from the disease may be minimised by incubating and brooding in the smallest units that are practicable and by keeping the chicks in darkness and not disturbing them during the first forty-eight hours of life, by immediate removal of weakly birds, by daily renewal of the litter and drinking water and by avoiding the use of dry mash and of troughs, the construction of which favours contamination by the droppings. Spread of infection from adult to adult is minimised by keeping the breeding stock in small units and by allowing the male bird in the breeding pens for the shortest time consistent with fertility.

The obvious point at which to attack the disease is in the adult carrier. Unfortunately, these carriers show no obvious symptoms during life except that they may be poor layers and one has to resort to certain methods now about to be discussed to recognise the carriers. On *post-mortem* examination, the ovary usually shows a proportion of the ova to be hard, shrunken, angular, discoloured and pendulous, and the causal bacillus can be recovered from the organ. The eggs of a suspected carrier may be examined bacteriologically, preferably after incubation, but, as only a small percentage of eggs laid by a carrier are infected, the method is not a practical one. Carriers may be tracked down to a particular pen by hatching the eggs from each pen separately and watching for the disease in the resulting chicks, but here again a negative finding has little value as the eggs set may not include the abnormal eggs of the carriers. Reliance is to be placed, however, on the agglutination test, which furnishes a ready means of detecting carriers. A blood sample is withdrawn from the vein which passes over the elbow joint of the wing and is tested in the same manner as are suspected cases of contagious abortion in cattle. The solution of the bacillary white diarrhœa problem lies in the elimination of carriers and the use of eggs for hatching from tested stock. The confidence of the poultry farmer in the test has, however, been shaken by the many instances where eggs purchased as being from so-called tested stock have yielded diseased chicks. It should be clearly understood that one test is not sufficient to eliminate all the carriers, as the reaction may not appear till some time after the infection or there may be a variation in the strength of the reaction. The term "tested stock" should be reserved for those flocks which have given two negative flock tests at intervals of at least three months. When flocks answering truly to this description are created either by private or Government enterprise, the first real step will have been taken to relieve a serious situation.

Coccidiosis, which ranks next to bacillary white diarrhœa as the most important disease of chicks, is responsible for heavy losses in the British Isles. The causal agent is a protozoan called *Eimeria* (*Coccidium*) *avium* which has a life history closely resembling that of the other species of coccidia. It is not necessary here to describe the many stages through which the parasites pass, and it is sufficient to recall that infection passes from animal to animal by means of oocysts or resistant forms which are discharged in the fæces. These cysts sporulate or hatch under suitable conditions of moisture and temperature and are then capable, if ingested, of infecting a healthy animal or re-infecting an already diseased animal. It is important to recognise that the cysts are not discharged in an infective state and that at least two days must elapse before the fæces which contain the cysts become dangerous. Another point to bear in mind is that the infection runs a self-limited course, the parasite passing through its various stages of development and leaving the body. The bird remains free unless re-infection from the outside takes place. The duration of the negative phase of the oocyst and the fact that multiple self-limited infections are the cause of the acute symptoms have an important bearing on the prevention of coccidiosis. Other equally important findings are

that sporulated oocysts are much more resistant than non-sporulated oocysts and that most chemical disinfectants, instead of destroying these resistant forms, favour their existence by killing putrefactive bacteria which are unfavourable to the life of the cysts. The oocysts are easily killed by dessication and by exposure to a temperature over 40° C.

Chicks aged two to eight weeks are most commonly attacked, the death rate sometimes reaching one hundred per cent., depending on the age of the birds and the degree of exposure to infection. Adults usually resist acute infection, but occasionally serious outbreaks occur amongst them.

The symptoms exhibited closely resemble those of bacillary white diarrhœa except that they are generally less acute and that the droppings are commonly of a brownish colour and frequently contain blood. Acute cases may be found dead or they may survive from two to four days, while other cases may survive for a month with progressive emaciation. Adult fowl show general unthriftiness and often diarrhœa.

The lesions in birds are confined usually to the intestinal tract. In per-acute cases catarrhal inflammation of the duodenum is present and the cæca may be congested or apparently normal. In cases of longer duration, one or both cæca are distended and the walls thickened and ulcerated. The cæcal contents vary in amount, colour and consistency, but commonly they are of a reddish brown, a somewhat characteristic finding in coccidiosis. It has been suggested that the catarrhal inflammation and thickening of the wall of the duodenum which are so often encountered in adult birds is due to coccidian infection.

The diagnosis depends on the recognition of oocysts, microscopic examination of wet smears of the duodenal and cæcal contents or of the droppings. Sometimes it is necessary to concentrate the oocysts, which may be done by making a thin emulsion of the material in water and straining through fine wire gauze. The fluid which comes through is added to an equal quantity of a solution of sugar prepared by dissolving one pound of sugar in three-quarters of a pint of water, and the mixture is centrifuged for several minutes. The oocysts are thus concentrated on the surface of the mixture and can be removed by allowing a small coverslip attached by plasticine to a match to come in contact with the surface layer in the centrifuge tube. A certain amount of experience is necessary to avoid confusing the cysts with worm eggs.

The best medicinal treatment for affected chicks is to mix one-third of a teaspoonful of powdered catechu to each gallon of drinking water and give this to the birds for fourteen days.

It is advisable to administer Epsom salts in the mash before and after the use of catechu, the dose for chicks aged up to five weeks being 10 grains and for chicks aged five to ten weeks, 15 grains. The treatment is harmless and should be adopted immediately suspicious cases are noticed without awaiting the result of laboratory diagnosis.

Bearing in mind what has been said before regarding the method of infection and the resistance of the causal parasite, certain preventive measures at once suggest themselves :—

If possible, duplicate houses, which can be occupied on alternate days, should be provided, thus permitting daily cleaning without unduly disturbing the chicks. If the nature of the flooring permits, it is advisable to wash it with *boiling* water. Alternatively, it may be cleaned dry.

It is necessary to renew the litter daily or every second day and to dispose of it by burning or by burial in quicklime. If circumstances permit, the chicks should be moved daily to clean land, the vacated land being ploughed and dug with a spade in places inaccessible to the plough. Diseased chicks should be burned or buried in quicklime without opening the carcases. Overcrowding and large units should be avoided. The food and water utensils should be cleaned with boiling water at least every second day. The food should be easily assimilated and not irritating. The grain ration should be reduced.

Roup presents a problem hardly less difficult than that of bacillary white diarrhœa. The difficulty arises mainly because the numerous diseases which are grouped under the term "roup" have not been accurately recognised or their etiology determined. Roup is a general name for practically any disease which affects the mucous membranes of the head of birds. It is not possible in a general paper such as this to give an exhaustive account of this group of diseases. The most that one can do is describe the most important member of the group and to refer very briefly to other conditions of a like nature.

The primary cause of true avian diphtheria or diphtheritic roup is a tenacious, filter-passing virus which gains entry to the body through wounds of the mucous membranes and skin. Secondary organisms play an important part in exciting the formation of the lesions. The disease is confined to birds and occurs most commonly in ordinary fowls, turkeys and pigeons.

There is great variation in both the incidence and mortality, depending on a number of factors, such as the methods of management, the prevailing weather and the virulence of the virus. The number of birds attacked may vary from a single case up to seventy per cent. or more. The mortality may reach seventy per cent. Losses are lightest in the summer and heaviest in the winter.

The most important losses in outbreaks arise more from a decrease in the egg production than from the deaths.

The clinical manifestations of true avian diphtheria are many. In the skin or chicken-pox form of the disease, nodules develop on the skin, especially of the head and of other bare or lightly-feathered parts of the body. At first the nodules are flat, smooth and yellowish, but later they become prominent, rough and brownish. Inflammation may spread from the nodules to the eye, resulting in an accumulation of caseous and purulent exudate in the conjunctival sac and infraorbital sinus. The eye may become very swollen—the "one-eyed" roup of the poultry farmer. Ordinarily the skin lesions alone, unless very

extensive, cause little interference with the general health.

In the diphtheritic form of the disease, the lesions appear on the mucous membranes of the head, especially of the mouth and consist of diphtheritic membranes of a yellow colour which adhere to the underlying tissue. These false membranes vary in size from that of a pin's head to a large mass displacing the parts. They may develop slowly or may form so quickly in the larynx as to cause asphyxia without the bird showing any premonitory symptoms. The mouth lesions have an offensive odour.

As the disease progresses the bird becomes dull, the breathing is difficult, the bird gasps for breath, the appetite is lost and diarrhœa may supervene. There is often a rattling or whistling sound, but these symptoms are not always seen when mouth lesions are present. Nasal catarrh, followed by obstruction of the nostril, is common. Inflammation may spread to the lachrymal duct and thence to the eye with the results already described. The disease may run a course of one day to several weeks, resulting in either death or recovery. Recovered birds may act as "carriers" of the virus, but the maximum time of carriage has not been determined. The degree and duration of the immunity depend on the severity of the attack, the duration varying from two to twenty-four months.

An accurate diagnosis of true avian diphtheria can be made only by filtration experiments or by a microscopic examination for the special cell inclusions which occur in the skin and mouth lesions. The existence of pox nodules is certain evidence of the disease and is strong, but not certain, evidence that co-existing false membranes in the mouth are due to the filterable virus. A diagnosis based on the naked-eye appearance of mouth lesions may be inaccurate and should not be attempted where there is likelihood of litigation.

Foreign bodies such as barley awns and pieces of litter may lead to the formation of superficial false membranes in the mouth accompanied by a discharge from the nose and eyes. Usually only odd cases occur, but the causal agent may be sufficiently operative to produce several cases. These present the greatest difficulty in differential diagnosis. Small, white, false membranes commonly occur in the mouth of birds. They show no tendency to spread and are only slightly raised above the surrounding surface. Several birds in a flock may show this condition, which does not affect the health. The cause is unknown. The differential diagnosis presents little difficulty.

Nutritional roup due to Vitamin A deficiency may present lesions closely resembling those of true avian diphtheria. Exudate may collect in the conjunctival sac and infraorbital sinus without the extensive involvement of the surrounding tissues seen in chicken-pox diphtheria. The exudate is white in colour and very easily removable. Diphtheresis may be present in the mouth, but the usual lesions are small white or yellow nodules about the size of a millet seed with a regular outline contrasting with the irregular shape of the diphtheresis caused by the filterable virus. The nodules are to be specially looked for in the œsophagus. I have been able during the last month definitely to confirm an outbreak of nutritional roup although previously many suspicious cases had come to notice.

Simple nasal catarrh may occur independently of true avian diphtheria, but it is not clinically possible to distinguish the condition from the first symptoms of the latter disease.

Let us admit at once that the means at our disposal for the curative and preventive treatment of avian diphtheria are both inadequate and inefficient, and that we to-day are unable to offer the farmer any advice which will speedily terminate an outbreak. There is no poultry disease regarding which we can hold out less promise of success as a result of our intervention than avian diphtheria.

Individual treatment of sick birds is indicated only when they are of special value and can be isolated. The nose may be treated with a two per cent. solution of boracic acid. Diphtheresis in the mouth should be carefully removed and, if the infraorbital sinus is distended, the contents should be evacuated following incision. Where a large number of birds have to be treated, the quickest way is to dip the bird's head in the boracic acid solution, keeping the beak open and uppermost.

In no disease is it more important that sick birds should be immediately removed from the flock. Individual routine handling is indicated, but care must be taken to avoid spreading infection by handling the mouth of a sick bird and then of a healthy bird. The avoidance of dry mash hoppers and of feeding of grain in the litter are specially important. The litter should be frequently renewed and all utensils disinfected daily. An endeavour should be made to divide up large units, especially mammoth laying houses.

In a recent paper read at the National Congress, reference was made to a Dutch vaccine against avian diphtheria and the results of a small field experiment were cited. It was suggested that the limited experiment showed the vaccine to have distinct preventive value. The claim of the discoverers that they had now fixed the virus which they use was quoted. Experiments have since been carried out on a large scale in Northern Ireland and the first apparently good results obtained have not, unfortunately, been repeated. No greater boon could be conferred on the poultry industry than the discovery of a virus vaccine of an efficiency equal to that of one used against rabies.

Tuberculosis is a common disease of farmyard fowl, but does not cause serious losses on poultry farms proper, chiefly because the birds are not kept after their second season. The disease is caused by the avian type of *Bacillus tuberculosis* which presents certain characters which need not be discussed here. Ordinary fowls are the most susceptible to infection, the disease being uncommon in other domesticated species. Wild birds kept in confinement frequently contract the disease. Tuberculosis of cage birds, especially parrots, is generally caused by the human type of Koch's bacillus and available evidence strongly

justifies the assumption that man may become infected from tuberculous parrots. The danger of tuberculous poultry to other domesticated animals is being increasingly recognised. Statistics show that up to 88 per cent. of tuberculous hogs may have the avian bacillus in the lymph glands and, if for no other reason than to safeguard the pig industry, we should intervene in this disease.

The incidence and mortality depend on a variety of factors. Up to 75 per cent. of a flock may become affected on general farms where birds are kept till they are over two years old. The mortality increases with the average age of the flock, the disease being uncommon in birds aged under one year.

The symptoms are aptly described by the popular description of the disease, "going light." As the disease develops, emaciation becomes marked, all the birds are unthrifty, show diarrhœa and have a poor appetite. Lameness is a common symptom and often corresponds to the so-called "rheumatism" of the poultry farmer. These symptoms are seen only when the disease is well advanced.

Lesions are almost constantly encountered in the liver and spleen and slightly less constantly in the intestine. The lesions, which may occur in any part of the body, closely resemble those seen in mammals and consist of nodules or tubercles.

Intervals between the deaths in a flock and symptoms of lameness should always arouse suspicion. The abdominal lesions are somewhat characteristic but microscopical examination for tubercle bacilli by the usual method should always be undertaken. Liver lesions occur in several diseases of birds but if nodules do not co-exist in the liver and spleen, one can be fairly certain that one is not dealing with a case of tuberculosis.

The intradermal tuberculin test applied to the wattle is an accurate method of detecting affected birds and offers a means of eradicating the disease in high grade flocks.

Unless the birds are specially valuable, they should be killed and those in good condition sold for the table. The land should be limed and ploughed or left vacant for several months before restocking. Unthrifty birds and those aged over two years should be culled. Food and water containers should be constructed to exclude the droppings as far as is possible and should be disinfected daily. Food should not be thrown near the house or in one fixed place. Pigs should be kept apart from poultry, from poultry manure heaps and from land fertilised by poultry manure.

Gapes or verminous bronchitis is caused by a nematode worm *Syngamus trachealis*. All species of birds appear to be susceptible, especially ordinary fowls. During the last three years in Northern Ireland wild birds have been examined in large numbers and up to ninety per cent. of certain species have been found to be infected. Chicks aged up to four weeks are most commonly attacked. Adult turkeys commonly harbour the gape worm without apparent inconvenience. The male and female parasites are nearly always found in copulation in the trachea, the pair resembling a red fork.

The symptoms in young birds are a curious listless gaping of the mouth, a wheezing cough and a frequent stretching forward of the neck in an endeavour to expel the worms. Frothy saliva and mucus may come from beak. Dyspnœa, inappetence, emaciation and general dulness with ruffling of the feathers are present. Unless they are treated, young birds succumb in large numbers. Infested adult birds may show no symptoms.

The lesions are usually confined to the trachea and bronchi, on the walls of which small abscesses develop at the point of attachment of the worms. The parasites are readily demonstrable.

Infection takes place by the ingestion of the eggs which have been coughed up or which have been released by disintegration of the female worms ejected. The eggs, which require to hatch outside the body to become infective, may survive for over a year on the ground in temperate climates, but it is probable that the reservoir of infection is the adult bird. It is known that adult turkeys act as carriers and it is probable that wild birds do so also.

Treatment may be applied to the individual or to the flock. The common method of inserting a feather into the trachea is not advised. Birds may be confined in a box and fumigated with camlin powder or with finely ground chalk and camphor. One c.c. of a 5 per cent. solution of sodium salicylate may be introduced by the mouth into the trachea, using a blunt canula, medicine dropper or fountain-pen filler.

The usual precautions regarding watering, feeding, disinfection, etc., are indicated. If practicable, chicks should be moved at intervals of five days to fresh ground, but only to land which will not be used for young birds within a year. Overcrowding should be avoided at all costs and the chicks should be kept apart from adult birds, especially turkeys, and from land recently occupied by adults. If dry land is not available, it may be necessary to rear the birds on floor boards. Every poultry farm should have land which is strictly reserved for chicks.

Infectious entero-hepatitis is the chief obstacle to success in turkey rearing. In the British Isles it has received the name of "blackhead," which is misleading because darkening of the head is by no means a constant symptom.

While all observers agree that the disease is carried by a protozoan, there is much dispute regarding its identity. It is unnecessary in a paper of this nature to decide whether it is an amœba or a flagellate. The important point is that the ingestion of fæces containing this protozoan does not lead to infection unless given along with embryonated eggs of the common round worm of poultry—*Heterakis papillosa*. It remains to be determined whether there are other accessory factors beside nematode eggs.

The mortality may reach 90 per cent. amongst young turkeys aged up to three months and 20 per cent. amongst adults. Ordinary fowls are said to contract the disease, but this is a rare occurrence.

Symptoms in young birds appear about one month after exposure to infection and last a few days. Poults are unable to keep up with the flock, and present the usual symptoms of debility, inappetence, ruffled feathers, etc. The droppings are soft or fluid, yellowish in colour and have an offensive odour. Unfeathered parts of the skin may show discoloration. Older birds show unthriftiness and may survive several months. The disease appears amongst poults most commonly in the summer and autumn and amongst adults in the winter and spring.

Blackhead is one of the few diseases of which the lesions are characteristic. The liver is enlarged and contains circular, degenerated areas of varying size which are yellowish or yellowish green on the surface and are not raised above the surrounding tissue. The cæca show lesions very like those seen in coccidiosis.

The diagnosis of the disease presents little difficulty when liver lesions are present and these have been previously seen by the examiner. Occasionally the liver may show only congestion but inflammation of the cæca, in the absence of coccidia, should be regarded as presumptive evidence.

Successful results are to be anticipated from the use of catechu as previously described under coccidiosis. Prevention depends on the usual methods of immediate elimination of sick birds and their safe disposal, the purchase of birds from healthy stock, the isolation of new arrivals, cleaning and disinfection of houses and utensils, and the evacuation of contaminated land. It is of the greatest importance that young turkeys should be kept away from grown birds and from ground occupied within one year by the latter. The problem of blackhead is capable of easy solution if turkeys are hatched and reared artificially. The popular prejudice that turkeys cannot be reared by artificial methods is incorrect, but a certain amount of experience is necessary for success. On general farms where incubators are not available, the hatching and rearing should be done by ordinary hens.

Fowl typhoid or Klein disease causes serious losses in the British Isles which are usually attributed to the rare disease fowl cholera.

The causal agent is *Bacillus sanguinarium* which closely resembles *Bacillus pullorum*. Or nary fowls only are naturally susceptible and amo t them the death rate may reach 50 per cent. or hi; r.

The symptoms are those of acute septicæmic disease with diarrhœa of a sulphur yellow colour which is somewhat characteristic. The duration of the disease is from one to ten days with death as the usual result.

The lesions are not diagnostic. The liver is generally enlarged, congested and friable and does not contain nodules. A bronzy discoloration of the organ, which is somewhat characteristic, is sometimes seen. Enteritis, usually of a mild type, is present.

Diagnosis depends on the isolation of the causal bacillus by laboratory methods. It is not possible otherwise to distinguish the disease with certainty from fowl cholera and fowl plague.

There is no curative treatment, except possibly by vaccination with a bacteriophage active against *B. sanguinarium*. Preventive inoculation with bacteriophage yields good results. The general precautions already described for other diseases should be adopted.

Many other causes of losses amongst poultry, especially infestation with external parasites, remain to be considered, but one must resist the temptation to discuss them, lest the value of the paper be lost in its length. Sufficient has been written to indicate the nature of the problem. Sufficient has been the invitation of your Division to indicate that Scottish veterinarians desire to solve this urgent problem of poultry diseases.

Discussion.

Professor D. C. Matheson, in opening the discussion, said: An industry which can command three World Congresses in seven years, as the poultry industry has done, demands our interest and support. The third World's Poultry Congress is to take place in Canada in 1927.

According to Professor H. R. Lewis, the poultry industry in America "in 1910 was equal to cotton and was next to corn, which is the leading agricultural product."

Addressing the Farmers' Club in London recently, Mr. Stanley Street-Porter gave some interesting figures, as reported in the *Scotsman*, November 2nd, 1926: "The estimated values of eggs and poultry produced in England, as compared with wheat, barley and oats, were also of interest . . . .

Wheat	£16,083,000
Oats	£13,470,000
Barley	£11,123,000
Eggs and Poultry	£23,779,000"

The relationship of the veterinary surgeon in his capacity of adviser on animal hygiene and diseases is touched upon in Captain Rice's paper. The practice here in Edinburgh is as follows: the poultry-keeper, or the poultry instructress, forwards birds for examination to the laboratory. A *post-mortem* examination is made, for which the fee is half-a-crown, and a report is forwarded. If practicable, that report draws attention to the fact that a leaflet on the disease in question can be obtained from the Board of Agriculture at a nominal price, and further states that the local veterinary surgeon might be consulted with regard to the suppression of the disease which exists in the flock. In that way we seek to correlate the work of the poultry instructresses, so far as management is concerned, with that of the veterinary surgeon who is the authority in matters of disease.

Of the eight diseases specifically mentioned by the essayist, six are the subjects of leaflets published by the Ministry of Agriculture, or by the Board of Agriculture for Scotland; many of these leaflets are illustrated. Leaflet No. 400 gives a list of these publications.

Mr. Rice raises the question: can the poultry farm pay? and his answer, as I read it, is, Yes. That is satisfactory. We are sometimes told that the bird is not worth the cost of the examination, etc.; and our answer is: the flock may be; the one bird is examined for the sake of the remainder; the half-crown for the *post-mortem* examination is paid to safeguard the rest.

Mr. Rice further draws attention to the question of the collection of blood samples for the agglutination test. Our practice is to advise poultry keepers requiring the test to obtain the services of their veterinary surgeon for this purpose. Many poultry keepers do it themselves; but there would be fewer spoiled samples and lost time if the veterinary surgeon were asked to undertake this work. Directions are issued from this laboratory and any veterinary surgeon who is interested can obtain information on application.

Are hens asked to do too much? According to the *Scotsman*, November 2nd, 1926, a White Leghorn hen laid 351 eggs in 365 days—a world's record. The bird was

owned by the University of British Columbia. Of the hens examined in my laboratory during the past 13 years, 3·1 per cent. had impaction of the oviduct, and 10·4 per cent. suffered from peritonitis, complicated in many instances with impaction of the oviduct. Out of a population of 402 selected birds the death rate was 7·4 per cent. and 36·6 per cent. of these dead birds had suffered from peritonitis complicated, in most instances, by impaction of the oviduct. Those cases do not include the condition known as "egg-bound," by which is meant that the hen, for some reason or other, is unable to lay her completely formed egg. If a bird ought to be laying, yet is not, the question of the possible existence of impaction of the oviduct should be considered. In one instance that came under our notice the oviduct was imperforate.

Small units, as the essayist points out, facilitate the control of disease, and, by limiting the opportunities of infection, make for health.

It is usual to say that the birds ought to work for their living, hence the practice of scattering grain in the litter, when, of course, it is liable to become contaminated with the droppings, which may be objectionable.

Of the domesticated birds examined in this laboratory during 13 years, 5·1 per cent. died from internal hæmorrhage, following rupture of the liver. The liability of the liver of the fowl in prime condition to rupture should be remembered when handling such a bird.

In speaking of the agglutination test for bacillary white diarrhœa, the essayist does not mention the question of the agglutination titre. It would be interesting to know what titre he would regard as indicating a positive reaction.

Does Mr. Rice agree with Captain Doyle that chicks which survive an outbreak should not be used for breeding stock, owing to the high percentage of such chicks which become carriers of the infection?

How may we diagnose roup at the present time? The essayist will probably agree that the employment of filtration experiments, or even of microscopical examinations for cell-inclusions, is not a practical method of diagnosis. He gives one hint—search for the pox nodules—but if these cannot be found?—as sometimes they cannot be!—then we must rely upon our experience of the other lesions, and avoid the use of the word "roup" altogether in diagnosis. Describe the lesions found, in accurate scientific language, for diagnostic purposes. When handling diseased birds care must be taken not to dislodge portions of the false membranes inadvertently, otherwise they may fall back into the throat and asphyxia result.

Ten per cent, of the poultry examined in this laboratory during the past thirteen years were tuberculous, and usually the tuberculosis was advanced. The owner of the diseased bird receives a report, drawing attention to the leaflet published by the Ministry of Agriculture, and is advised that the flock should be examined for other cases. Usually nothing further is heard of the matter. That is unfortunate, for it means that the poultry keeper goes on feeding and housing a bird or birds which are entirely unprofitable and are also a menace to the still healthy birds. On farms, as the essayist points out, tuberculous fowls are a menace to the hogs. When tuberculosis is found to exist in a flock, the "piners" should be culled, and the apparently healthy birds should be submitted to a tuberculin test. Mr. Rice mentions the intradermal test, it would an advantage if he were to explain the method in detail.

When speaking of the so-called "black-head" in turkeys the essayist does not mention treatment by ipecacuanha, which has been found serviceable by some workers. The Kansas State Agricultural College Circular No. 106, gives the following method:—

"For each 20 birds give two teaspoonsful of powdered ipecacuanha mixed in a mash twice a week until the poults are three months of age; then reduce the dosage one half and give once each 10 days, until the birds are ready for market." We also have found ipecacuanha, both in the powdered and in the liquid extract form, useful in dealing with cases of black-head in turkeys. In discussing fowl typhoid the essayist mentions treatment by the use of a bacteriophage, active against the *Bacillus sanguinarium*. We should be glad if Mr. Rice would explain this method of treatment more fully.

In conclusion, I may say I have read Mr. Rice's paper with interest and profit, and beg to thank him for preparing it and for coming here to-day to defend it.

Mr. McCallum (Board of Agriculture for Scotland) said he would congratulate the Division on holding a meeting of that kind as indicating their appreciation of the importance of the poultry industry. Professor Matheson had called attention to the fact that the estimated annual value of poultry produce in Britain ran up to twenty-three million pounds. We also imported annually from abroad, something like twenty million pounds' worth of poultry produce. The members of the Board of Agriculture were endeavouring to the best of their ability to encourage the poultry industry in this country, so that they might be able to produce at home a considerable proportion of that produce imported from abroad. If that was done, the industry at home was going to be developed to a very considerable extent. One of the first things that would help was an intimate knowledge on the part of veterinary surgeons especially, and a working knowledge on the part of the poultry keeper, in regard to disease. It seemed to be inevitable, when such an industry was being developed and birds were being kept in considerable numbers, that diseases should exert a considerable influence in checking the development of the industry. He thought it a matter of great gratification to find veterinary surgeons turning their attention to poultry diseases, and that that meeting had been called together specially to consider them. It was a matter of interest, also, to find that they had asked their colleague from Northern Ireland to tell them about poultry diseases. Their chairman and some others had had the pleasure recently of seeing something of the poultry industry in Northern Ireland. The main feeling produced in their minds was one of envy. They would like very much to see developments on that side of the channel comparable to what they found on the other side. (Applause).

Mr. J. D. Pottie, Greenock, asked if there was an inspection of poultry before it was used as human food. He thought that was a most important thing.

Mr. Rabagliati said sanitary inspectors were employed on that work who were also retention officers in the abattoirs. They went round regularly to the different shops and they did examine dressed poultry. He did not think there was any inspection of living poultry. Any bird considered unfit for food was seized.

Replying to Mr. Pottie, Mr. Rabagliati said the sanitary inspectors were competent to examine the birds from a food standpoint. Those men, in Edinburgh, worked under the veterinary service.

Mr. Robertson, Arbroath, said that as a profession he thought they knew very little about poultry diseases. Recently in his district two or three people had gone in for poultry farming and when he was called in to attend cases he found many difficulties. Professor Matheson had raised the question about testing for tuberculosis. He would like to know more about that. He wished to be informed what was Mr. Rice's personal opinion about using, for human food, carcases of hens suffering from tuberculosis. He himself would be rather chary about using them. He had had an experience last year in which there were a lot of deaths from bacillary diarrhœa. He got samples of blood from several birds tested and advised the man to destroy these birds. He would not do that. He got results this year and they were practically the same as last year. Probably the infection was still going about the farm so long as he had those birds.

Mr. Rabagliati said he wished to add his *quota* of thanks to Mr. Rice for his paper. Mr. Rice was an enthusiast on that subject. He was afraid that, in the slow method in which things usually moved in this country, they had still a long way to go before the veterinary profession and the poultry keepers arrived at the ideal for production held by Mr. Rice. There was no doubt that when they went in for breeding birds to lay to such an extent, it must weaken

their constitution and make them more susceptible to disease, and he thought this applied to other animals also. Mr. Rice said a good deal of improvement might be made in the matter of feeding. He (Mr. Rabagliati) thought that was a point which the veterinary profession might take up. Professor Linton had done much work on that subject, and there was room for others to follow his lead. What was the difference between fowl cholera and fowl typhoid? Did the first occur in Britain and, if so, what were the distinguishing features? In Egypt, when he was there, the veterinary profession took up a lot of work on that subject. The chief disease there was fowl plague. The veterinary service took the matter up more on the lines of general control of disease rather than scientific investigation. They had veterinary inspectors at the stations examining the fowls when they arrived and picking out the diseased birds. What was Mr. Rice's method of diagnosing fowl typhoid and fowl cholera? Another question—was it always possible in fowl cholera to find an organism in the blood, if one examined blood films?

Professor LINTON referred to the question of blackhead in turkeys, and said there was work done in Canada some years ago wherein it was stated that if they fed young turkeys on insect protein they failed to develop blackhead. Had that been confirmed? The fowls' natural food consisted largely of insect life which they found when they scratched in the ground. If they examined the food put out by the big commercial firms they would find in some a very small percentage of insect protein. Personally, he thought far greater use might be made of these insects. With regard to the question of scratching, it seemed to him that they must supply poultry with dry grains in the litter. The question of scratching was not wholly a point of giving the birds exercise. They could give them a cabbage to which to jump up. Scratching was a natural thing for the fowls to do. Fowls in the big poultry farms were kept under the most unnatural conditions—overcrowded, badly fed. Reading what Mr. Rice said, he was inclined to think he wanted to do away with the scratching in the grain. He did not think that would be wise. Was it a good thing to feed poultry entirely on wet mash? In regard to nutritional roup, there was a paper published two years ago showing that nutritional roup followed the feeding of poultry on foods deficient in green food. One hesitated to speak about vitamines at the present time. Mr. Rice had referred to the removal of bedding. He (Professor Linton) thought most poultry farmers did remove the dirty bedding every day and tried to keep their places clean. In connection with tuberculosis, personally he would be inclined to recommend anybody with tuberculosis in his poultry herd to destry them all and clean the whole place properly. He thanked Mr. Rice for his most interesting paper.

Mr. POTTIE asked if Mr. Rice believed in the administration of medicines to poultry in their food, or by giving them the medicine on the tongue.

Mr. HENDERSON, Broughton, thanked Mr. Rice for his valuable paper. He had some poultry and found them quite interesting. He experienced considerable losses from leg weakness and he would like to hear something of the causes and the treatment of the condition. With regard to roup, he was interested to hear that it was due to a filterable virus. One of his chicks had been ailing and he killed it. In the killing of it he happened to bruise its head and some cheesy matter came out of the eye-socket and nose—the symptoms of roup, he believed. The exit from the henhouse was rather muddy and wet. He took it that, as there was no other outbreak, the germ of the roup which produced that case was really everywhere and was only brought into action by adverse conditions. He had had a letter from a man in Norway about a crate of poultry which had been dispatched in perfect health. Through some mistake they were held up in a dark railway waggon for twenty-four hours, and they developed a very bad form of roup.

Mr. MILLER said that, like Professor Linton, he would hesitate to condemn dry mash feeding. He thought it need not be a dangerous source of infection if the food hopper were so constructed as to avoid contamination by the droppings, and he understood one was on the market at present for which this was claimed. The majority of poultry keepers seemed to consider that the advantages of time and labour saved outweighed the disadvantages.

In speaking of disinfection, Mr. Rice stated how not to disinfect, and pointed out how farmers often attempted disinfection, but it would be an advantage if he would tell them exactly how he considered that disinfection of a poultry house, which had housed birds affected with, say, roup or tuberculosis, should be carried out.

With regard to the treatment of roup lesions—and there were outbreaks when the numbers of affected birds were so large that individual treatment (rather than slaughter) of the affected bird was absolutely necessary—he had found that a mixture of equal parts of tinct. iodine, 2½ per cent.; glycerin. and tinct. benzoin co., was greatly superior to aqueous solutions or alcoholic solutions of iodine, or silver salts. He advised that the dressing be applied once or twice daily after the false membranes had been first removed. In one large poultry establishment near Edinburgh, the owner, upon advice, invariably swabbed out the mouths of every newly-purchased bird before it was released upon the premises. Any obviously-affected birds were put aside and returned. Previous to the adoption of this procedure that poultry farm had had two devastating outbreaks, but since swabbing the mouths of all new arrivals, they had had no cases.

The same mixture had proved very useful in the treatment of "vent gleet." It was syringed into the cloaca once daily, in 30 minim amounts, and three or four applications usually served to eradicate the condition.

Upon another point, they had found that the administration of permanganate of potassium, so often advocated in text-books as an internal antiseptic for roup, had a great tendency to cause digestive disturbances, and was too astringent. He wondered whether Mr. Rice would say whether copper sulphate, which he had been using recently, had advantages in that respect. It would appear so from his (Mr. Miller's) experience.

Finally, he would like to add one more to the already large stock of questions which Mr. Rice had been asked: could he tell them the composition of the "Camlin" powder which he recommended for the treatment of gapes in chickens?

He also would like to thank Mr. Rice for having presented them with a useful and thoughtful paper.

Principal BRADLEY said he would like to express his gratification at the interest that had been taken in Mr. Rice's paper. It was indicative of the awakening in the veterinary profession to the importance of the poultry industry. Like Mr. McCallum, he had his eyes opened and his soul filled with envy by the visit to Northern Ireland. They did things—so far as poultry was concerned—much better over there. He did not wish to say that the people in Scotland were not doing their level best. They undoubtedly were. But somehow or other Northern Ireland seemed to be better organised, so far as they could see. It was their hope that Scotland would be able sometime not only to equal Northern Ireland, but, of course, ultimately to surpass it. (Laughter). More than one speaker had touched on the hard work the hen was called on to do. He had, personally, a great admiration for the hen and he regarded her internal economy with amazement. They lacked appreciation of the difference that had been effected in the hen as they knew her to-day and the hen as she was before man took her in hand. Did they realise that a hen, weighing on the average 4 lbs., produced in one year at least 300 oz.? That was to say—a hen weighing 64 oz. produced 300 oz. The hen, after she had done all this had to provide herself with a new suit of clothes. The poultry keeper would no doubt be greatly rejoiced if she could economise in the matter of raiment. (Laughter). But, more than that, she had to keep up a large mass of muscular tissue which man insisted she should not use, but he insisted she should continue to have it in order that she might finally become useful to the kitchen. It was perfectly obvious to him that man had made an

abnormal creature out of the hen, and would continue to do so, and directed all his research at present to making her still more abnormal. It was impressed on him that the result would be that she would be more and more diseased, unless something was done to prevent that. Man could not tamper with the animal machine indefinitely without something happening. It was up to them to do what they could to prevent disease or, if it occurred, to stop its ravages. It was a matter of considerable gratification to him to see so many there that day keenly interested in that subject. As Mr. Rice had said, it was an urgent problem for the veterinary profession. A point on which he was not inclined to agree with Mr. Rice was where he gave the impression that the veterinary surgeon did not know enough about poultry diseases. He hesitated to admit that. So far as the younger generation of veterinary surgeons was concerned, he was prepared to deny it. They had in that institution laid, as far as they could, the foundations of a serviceable, useful knowledge of poultry diseases. Obviously, they must increase the extent of that foundation as time went on. They must teach the student what they could, and it was up to the student, when he became a responsible citizen, to extend his knowledge.

The Reply.

Mr. Rice, replying to the dicussion, said he had graduated in that school and it was in that school that he received his first interest in poultry matters. Professor Matheson had drawn attention to certain points, and asked if he was in favour of the collection of blood samples of bacillary white diarrhœa. He was, but he thought, if the test was to be carried out properly, they must be collected by the veterinarian. The most important point raised by Professor Matheson was—did he agree with Captain Doyle's advice that the survivors in an outbreak of bacillary diarrhœa should not be used for breeding? He thought Captain Doyle's advice was too drastic. If it went out from the veterinary profession that all survivors must be condemned, they were giving very serious and perhaps ruinous advice. He could endorse entirely Captain Doyle's advice. With regard to roup, Professor Matheson suggested that when reporting on birds showing mouth lesions, they should leave out the word "roup." Two or three years ago he himself thought it was the easiest thing in the world to diagnose roup. Now he had come to a different conclusion. He agreed with Professor Matheson's suggestion. The tuberculin test was described in a little exhibit he had upstairs in Professor Matheson's laboratory. Briefly, one took a drop of 50 per cent. avian tuberculin, and injected it into the wattle. American investigators advised that the subsequent swelling should be examined at 24, 36, and 48 hours. He thought one observation in 48 hours was sufficient. Most of them knew the intradermal test in cattle. One would doubt whether, even in the intradermal test in cattle, one did always get into the deeper part of the skin. In testing birds he was sure he had often got it under the skin, but they gave wonderful results. Professor Matheson stated that ipecac. was used there. He agreed that it was quite good. His experience was that catechu was equally good. With regard to bacteriophage, Professor Matheson had asked him a really difficult question. Bacteriophage was a comparatively new thing to the veterinary profession. It was a very difficult thing to explain. If one took a culture of, say, *Bacillus pullorum*, and planted that out, one would note two types of colonies. The organism in one case was grown on a colony which was quite smooth; in the other type the edges were very ragged. The colony seemed eaten away. Certain French workers said that erosion was brought about by a filter-passing virus. The *Bacillus pullorum* had a smaller organism upon it. One could take that eroded colony and pass it through a filter, and through the filter would come the filter-passing-virus which was the bacteriophage. In typhoid, they grew the typhoid organism in ordinary broth. They added to the broth some of the filtrate from one of the eroded colonies. They put the mixture back in the incubator, and the culture of the typhoid organism was eaten away. What then issued was merely the filtrate of that eaten-up culture. Proceeding, Mr. Rice said one liked to hear from Mr. McCallum the desire that the poultry industry should go ahead hand-in-hand with the veterinary profession. As to the question of medicated food or oral administration, poultry husbandry required economy of time and labour. Where one had a large number of birds to treat, it was advisable to mix the medicine up with the mash. He was asked what the risk was of selling carcases of tuberculous flocks for human food. He advised first of all taking out the unthrifty birds. There was a small risk. Even dressing the bird for table might leave behind some bone lesions, which were not uncommon in poultry. He was asked a question about fowl cholera, fowl typhoid, and fowl plague. He would refer the gentleman to the paper which he (Mr. Rice) read at the Dublin Congress. He would find there that fowl typhoid was caused by a bacillus—*Bacillus sanguinarium*—closely allied to *Bacillus pullorum*. That was the most important disease in the British Isles. Up to a few years ago, most people thought fowl cholera a thing that was extremely rare. The method of diagnosis was by the usual cultural method—the sugar method and the inoculation of rabbits. Fowl plague was caused by a filter-passing virus, and inoculation of filtrate into birds resulted in death in about two days. Professor Linton had raised the question of insect protein and blackhead infection. He (Mr. Rice) had no information on the subject and he could only state that beetles, which supplied the insect protein in several animal mixtures, were not quite harmless for poultry. It was said that they could keep the litter clean. They could, but very few did it. He had seen it a mixture of one-third original litter, one-third droppings, and one-third feathers and a few other things buried there—and, most important of all, the decomposed grain. He thought Professor Linton's experience of bedding could not be in agreement with their President's opinion of Scottish poultry keepers. If they kept their bedding as well as he said, they would be much ahead of poultry keepers in Northern Ireland. He did not favour tieing up a cabbage in the poultry house. The bird was expected to lay every other day. It had an egg in its oviduct—and they had heard Professor Matheson's figures. One hesitated to recommend any method where a bird with an egg in its oviduct was going to jump up and do gymnastic feats in order to get the cabbage. Wet mash against dry mash had been the subject of the greatest controversy in the poultry industry. Purely from the point of view of possible infection he favoured dry mash, although he had mentioned that wet mash was better than dry, but that was merely his personal opinion. With regard to nutritional roup, they would see among his specimens a specimen of it. There were small lesions in the œsophagus. He was asked if the dirty bedding should be removed every day. In Northern Ireland they advised that it should be renewed in the winter once a week, usually it was once in four to six months. It was the same in England. Referring to the question of slaughter in tuberculosis, Mr. Rice said if one won a large laying test or some other test, and one had the progeny on the farm, and one of them went down with tuberculosis, they could not slaughter them all. They would have to test them. He had very little experience of leg weakness except in pullets. In laying tests pullets commonly went down with weakness. Leg weakness in chicks he knew little about; it was said to be due to close confinement, unsuitable dieting, etc. Dry mash hoppers had been mentioned by Mr. Miller. Three years ago the suggestion was made that a dry mash hopper had been designed to exclude the droppings. He doubted it, and the fact was that no such design had been effected yet. He was sorry he could not describe methods of disinfection there, it was too long a subject. All of them there had had training in matters of disinfection. He did not like to suggest that all birds' mouths should be swabbed out as a routine method. He thought there was a danger of spreading infection. Unless one renewed the swab one used between each bird it was not without risk. On the question of potassium permanganate, he agreed that it put the birds

off their food. There was nothing to which he was more opposed than the use of internal disinfectants in the drinking water.

Mr. POOL said it was his duty to move a vote of thanks to Mr. Rice for coming so far to give them such an interesting paper. Disease was probably the greatest problem with which the poultry keeper had to contend at present. The veterinary profession, he thought, must take far more interest in the future in the diseases of poultry and some other domestic animals than they had done in the past. There had been almost a revolution in veterinary work during the last twenty years. To a large extent, there was a disappearance of horse practice, and they saw the possibility of another practice to take its place.

Principal BRADLEY joined in thanking Mr. Rice, and congratulated him on being the author of an extraordinarily interesting and stimulating paper.

The vote of thanks was heartily accorded and Mr. Rice briefly returned thanks.

Translucency of the Cornea.

Opacity of the cornea is a common cause of impaired vision in every degree from the slightest defect of sight to complete blindness. It is, therefore, important to understand what causes corneal opacities and how far they are curable. The anatomical structure of the cornea consists of parallel fibrous lamellæ bounded on the outside by an epithelium and on the inner side by an endothelium, which normally protects it from infiltration by the aqueous humour. Slight opacities may be caused by injuries to the epithelium, but this is soon regenerated and complete transparency may be restored. Infiltration of fluid into the substantia propria may be due to pressure, as in glaucoma, or to disease, such as interstitial keratitis. In this case the infiltrating fluid contains cells, and the opacity may be extreme. Nevertheless, the infiltration may eventually be completely or almost completely absorbed and the transparency of the cornea restored. A third type of corneal opacity occurs from actual injury of the fibres of the substantia propria such as results from a deep ulcer or a wound. Here the opacity may be partly due to infiltration and, in so far as this is the case, treatment by such things as stimulating ointments may be partially effective, but there remain the cases in which there is actual replacement of the normal fibres of the cornea by scar tissue. In the worst cases, such as follow a severe ophthalmia neonatorum, the whole cornea may be converted into scar tissue, and in these no treatment which has hitherto been devised can possibly restore the transparency. A suggestion has been made by Dr. S. G. Moore, who has seen the wonderful specimens prepared by Prof. Spalteholz, of Leipzig, in which the tissues are rendered so translucent that, for example, injected arteries are readily seen in relief in transmitted light—that this process, applied to living tissues, might restore some measure of useful vision in cases of blindness due to opacity of the cornea. Dr. Moore believes this process to be secret, but reference to Bulletin No. V (p. 41) of the International Association of Medical Museums shows that it consists in impregnating the tissues with a fluid of suitable refractive index, composed of oil of wintergreen and benzyl benzoate. Although the application of methods of this kind to living tissues was foreshadowed by Mr. H. G. Wells in his "Invisible Man," it can hardly be expected that living protoplasm should survive so gross an insult to its normal refractive index.—*The Lancet*, October 9th, 1926.

The Veterinary Record.

8th January, 1927.

VAUGIRARD.

During the past few years the public have, from time to time, been alarmed with tirades against the exportation to the Continent of Europe of horses, no longer fit for hard work, to be slaughtered on that side for human food. Allegations became so frequent that the Government were forced to take active steps, and to enquire into what became popularly termed "The worn-out horse traffic." After a patient enquiry in order to find means of appeasing undue alarm, certain rules and regulations were formulated, and qualified officials were appointed to see them carried out. Even this did not quieten individuals who seemed obsessed with the idea that nobody but themselves had any humanity left, and who went over to the Continent and endeavoured to raise an agitation in various countries. On several occasions in answer to enquiries in the House of Commons the Government assured the country that the traffic in horses for human food was carried out to the satisfaction of its officials, most of whom belonged to our profession, and were men of high integrity.

As the agitation was still in existence during the month of November last, a well known contributor to the *Record*, happening to be in Paris at that time, took the opportunity of paying a surprise visit to Vaugirard on the outskirts of Paris, where over 70,000 horses are killed annually for human food. At this *abattoir hippophagique* he saw about fifty horses in good condition, feeding peacefully on hay and straw, and having in front of them a long trough filled with water. There were five or six horses further up the stable awaiting their turn for slaughter. Of course, these were naturally without food or water, as it is the custom everywhere to fast animals prior to slaughter. He also witnessed the actual slaughtering, which, he affirms, was done as humanely as possible. None of the live horses was of British origin or of British breeds; in fact, Monsieur Pérard, the chief veterinary officer who courteously gave him all the information he desired, assured him that no live horse from the British Isles entered that place, only the carcases of horses slaughtered and inspected on this side of the water being received there.

It should be mentioned that the French working class prefer fresh horse flesh to imported frozen or chilled meat, and pay a higher price for it. Monsieur

Pérard told our informant that British veterinary surgeons often visited the institution, of which he was in charge and were, like him, quite convinced that there was no occasion, so far as Vaugirard was concerned, for the campaign in Great Britain. This matter concerns the veterinary profession not only in Great Britain but also on the Continent, and it appears that it is time a check was put upon those who make unfounded implications against its honour and humanity. It is an insult that should be resented, as the veterinary profession, by virtue of its function is, as a whole, morally responsible for humanity to the brute creation.

The traffic in horses for human food is more of a humane than a cruel business, for if an owner is going to get a good price for his rather worn, but otherwise well-conditioned horse, he is much more readily disposed to cease working it before its labour has become too painful or fatiguing than to continue working it, as he would very probably do, if he were only going to get £2 for its carcase.

Ministry of Agriculture's Director of Veterinary Research.

DR. W. H. ANDREWS' APPOINTMENT TO WEYBRIDGE.

We have pleasure in announcing the appointment, as Director of the Ministry of Agriculture's Veterinary Laboratory at New Haw, Weybridge, Surrey, of Dr. W. H. Andrews, Senior Assistant in the Research Institute attached to the Royal Veterinary College, Camden Town.

This appointment fills the post rendered vacant by the lamented death of Sir Stewart Stockman, who held it in conjunction with his duties as Chief Veterinary Officer to the Ministry—the position to which Mr. J. R. Jackson was recently appointed.

WILLIAM HORNER ANDREWS.

Fourth son of Major H. G. Andrews, A.O.D. (retd.), William Horner Andrews was born at Southsea, Hampshire, on 22nd June, 1887. After attendance at the Grammar School, Kingston, Jamaica (1898-9), and the Mathematical School, Rochester (1900-1904), he entered the Royal Veterinary College, London, in October, 1904, and followed, in addition to the usual courses leading to the R.C.V.S. diploma, the special courses for the newly-instituted B.Sc. degree in Veterinary Science of London University.

Graduating M.R.C.V.S. in July, 1908, he was awarded the Jubilee Memorial Bursary, which he held in Paris; here he took the Cours de Microbiologie of the Institut Pasteur, and worked in the bacteriological and pathological departments of the Alfort Veterinary School.

A return from Paris was made in August, 1909, and after a few months in Sir J. M'Fadyean's laboratory, he joined the staff of Dr. A. Theiler as Assistant Veterinary Bacteriologist to the Transvaal Government. After the fusion of the various South African colonies, in 1912, he passed into the service of the Union of South Africa as Veterinary Research Officer.

In September, 1914, he joined the S.A. Veterinary Corps, and was appointed Captain, and O.C. No. 1 Section, seeing service in German South-west Africa, chiefly on mobile duty, and being "mentioned in despatches." Captain Andrews was recalled to the laboratory in December, 1915.

In 1918 he was promoted Senior Research Officer, and was sent to take charge of the branch laboratory in Natal.

In 1920, while retaining his post as Senior Research Officer under Sir Arnold Theiler, he was appointed to the staff of the new Veterinary Faculty of the University of South Africa, as Professor of Physiology.

The degree of D.Sc. (London) was awarded him in 1921 for work on a form of "staggers" occurring in cattle in Natal.

Dr. Andrews left the South African service in May, 1924, and in August joined the staff of Sir J. M'Fadyean as Senior Assistant in the Research Institute attached to the Royal Veterinary College, Camden Town.

In 1916 the subject of this brief biographical sketch married Doris, daughter of the late H. Burls, Esq., of Christiana, Transvaal. He has one son and one daughter.

R.C.V.S. LIBRARY.

The following books have been added to the Library during the past week:—

Brumley: "Diseases of Small Domestic Animals";
Calkins: "Biology of the Protozoa";
Hall: "Diagnosis and Treatment of Internal Parasites";
Henry and Morrison: "Feeds and Feeding";
White: "Principles and Practice of Veterinary Medicine";
Malkmus: "Clinical Diagnostics";
Law: "Veterinary Medicine," 6 volumes;
Leeney: "Home Doctoring of Animals";
Wallace: "Farm Live Stock of Great Britain."

Books may be borrowed from the Library by members of the College on payment of postage both ways. Apply to the Librarian, 10 Red Lion Square, London, W.C. 1.

PERSONAL.

Will.—Mr. William Sheaf, of 7 Chepstow Road, Newport, veterinary surgeon, who died on March 20, aged 77 years, left estate of the gross value of £6,229, with net personalty, £3,877. Testator left his property in trust for his wife for life, with remainder to his children or their issue in equal shares, the share of his son William Thomas to be retained upon special trusts for the benefit of himself and his children.

CLINICAL AND CASE REPORTS.

A Rectal Alibi.

By F. W. CHAMBERLAIN, M.R.C.V.S., Cheam.

A fortnight since, I motored into an adjoining county to examine a steeplechaser as to soundness. Having fulfilled my errand, I accepted the trainer's kind invitation to lunch and, it being the Sabbath and so more or less a *dies non*, we sat afterwards smoking and talking "horse." As an afterthought, just before I left and as day was closing, he asked me if I would have a look at a case that was puzzling him.

Subject.—A somewhat puny cross-bred Friesian bull calf, two days old.

History.—As given me, this was that just after his entry into the world it was noticed that a piece of bowel was protruding from the navel. They pushed it back and put a suture across the orifice of the navel. I inspected the part by the aid of a stable lamp, and noticing considerable swelling, erroneously concluded that the navel-string had been snapped off too short and that a forcible rent had accrued at the umbilicus; that it had been roughly sutured and that the swelling was due to such suturing.

This, however, was only part of the story. Next day they had found that he had no anus. On looking, I verified that statement. Nor was there any pouting or protrusion there. I concluded, therefore, that not only was it a case of imperforate anus, but a case of atresia or imperforation of both anus and rectum. I told them he would certainly die if no anus were provided and that probably within five days from birth. I then proceeded—save the mark—to provide the necessary vent.

Lifting the tail, I made an incision where the anus should have been and quite confidently made a deep punctured wound forwards, expecting to hit the blind rectum. "Nothing doing." I introduced my index finger to its full length and found no trace of the expected *cul de sac.*

I then told the owner to inspect again from time to time and, if the looked-for protrusion presented itself, to puncture.

The calf, in any case, would only be destined for the butcher at a not very inflated valuation, so no further measures were suggested.

The calf died four days after birth and autopsy revealed the terminal portion of the large intestine some *two inches from the umbilicus.*

Thus I have no doubt that the portion of bowel returned at the time of the suturing corresponded to the rectum, and that the swelling I saw at the time of my inspection was not attributable to local inflammation as the result of suturing, but to gradual impaction of such bowel with fæces—with which it was crammed. I have not seen of heard of a similar case in practice, but in *Regional Surgery* (Möller amd Dollar), there is a record that Varolid saw *atresia recti* with cloaca formation and open urachus in a calf. A somewhat parallel case, apparently.

Sewage Poisoning.

By G. MAYALL, M.R.C.V.S., Bolton.

Veterinary literature seems very sparse in relation to the above subject, I have looked through many volumes without finding much reference to it. In 1906 several cows at Whittingham Farm, Norwich, died, and poisoning was suspected. The grass was sewage grown. The deaths at the time were attributed to what was described as "conia, the active principle of hemlock," which was detected in the ensilage, it being pointed out that the active principle of hemlock was "coniine" and not "conia." I remember challenging this at the time as follows:—"In the preparation of ensilage I believe that the temperature undergone by the contents of the silo is 130°F. It is stated by scientists that the exposure of the fruit and leaves of hemlock to a temperature exceeding 120°F. (or 10°F. less than that in the silo) renders them inert. If this be so, how did the hemlock poison the cows?" Unfortunately for veterinary science, neither the results of the *post-mortem* examinations on the cows nor the symptoms of their illness was ever publicly stated, but in any case the symptoms of hemlock poisoning and those of Jöhne's disease are by no means similar.

Sir John Moore, K.C.M.G., F.R.C.V.S., gives a short account of Sewage Poisoning in *The Veterinary Journal* for January, 1924.—Some French farm horses and some of the horses of the Expeditionary Force died of sewage poisoning from drinking at village ponds. The symptoms were partial coma, paralysis, constipation and death in from ten to twenty-one days. These symptoms more nearly approximate those of the supposed hemlock poisoning. Sir John Moore relates that the ponds from which the horses drank were "brown and stinking with farm yard washings," and the analysts' report on the water was "badly contaminated with sewage."

Enormous Enlargement of the Spleen of the Horse.

By W. HUGHES, M.R.C.V.S., Caerwys, North Wales.

Subject.—A Chestnut, weight-carrying, hunter gelding.

History.—Purchased in Tattersall's, three weeks prior to illness.

Symptoms.—The day previous to illness the horse was in perfectly good spirits and had done his usual exercise. When taken ill the temperature was 106° F., quickened pulse—100 beats to the minute; breathing 32 and muco-purulent discharge from both nostrils. Visible mucous membranes dirty yellow, and liver complications were suspected. The horse was found dead on the fifth day.

Post-mortem.—This revealed pneumonic areas in both lungs, and the spleen had lost its triangular appearance and had assumed a square shape, with its edges rounded. It weighed 28lbs. It was sent to Professor Buxton per rail and was delayed on the

(Continued at foot of first column next page.)

REVIEW.

[**Common Colics of the Horse,** by H. CAULTON REEKS. Fourth edition, crown octavo, pp. 403. Published by Bailliére, Tindall and Cox, 10s. 6d.].

This book is written in so pleasing a manner, with such delicacy where the author would prefer his own views, and with such consideration where he would deprecate the views of others, that the reviewer might well be excused if he forebore to criticise the matter it contains and contented himself with expressing an admiration he must truly feel.

It is a book written in the romantic style, the last perhaps of the old classics devoted solely to the diseases of the horse, a proper descendant of Youatt, Percivall, and, most lately, Hunting, combining a wealth of sagacious first-hand observation with many references to the observations of others.

The motif of the book is an oft-expressed belief in what the author himself designates the "stimulant" method of treating colic in its several manifestations as opposed to what he calls the "sedative" method. He gives excellent reasons for preferring the administration, in conjunction with aloes and linseed oil, of such so-called "stimulants" as carbonate of ammonium, nux vomica, oil of turpentine, and methylated ether, to the administration of narcotics, or, as he terms them, "sedatives."

The latter are defined on page 382 as follows:—"The sedatives in common use are opium and its alkaloid morphia, belladonna with its alkaloid atropine, chloral hydrate, and cannabis indica." He believes that the "stimulants" excite peristalsis and that the "sedatives" depress it. He points out with evident truth that in abdominal affections of the horse much depends upon the early restoration of a function which is far more frequently exercised than in man, viz., the function of defæcation. He makes it clear that the use of any agent which might interfere with the frequency of that function is absolutely contra-indicated in the treatment of a disease which calls, if anything, for its greater frequency, and he beseeches us to frame our prescriptions accordingly. The argument is a little out-of-date, or perhaps it would be more gracious to say that the lessons emphasised by Mr. Reeks have been so well learned that there is to-day less reason for his representations.

It would, we think, be difficult to find at the present time many veterinarians who rely for the treatment of colic in the horse upon a formula based chiefly upon any of the above-mentioned narcotics, although such a treatment was common enough when the first edition of this book appeared. The reviewer can remember, for example, that when he was a student at the old (Dick) College in Clyde Street, Edinburgh, a stock colic medicine in the pharmacy of that institution was a mixture mainly composed of opium and ether, but he would be surprised to learn that this form of medication has survived the teachings of Mr. Caulton Reeks and Mr. W. W. Lang.

Narcotics such as chloral and morphine with atropine are of course still largely used to allay pain, *but only in conjunction with purgatives or large quantities of hypertonic salt solution*, and it is hard to believe that used in this way they can do any harm. In the bad old days opium and its tincture were largely used in the treatment of colic, but opium is not used much nowadays; cannabis indica in this country is almost forgotten.

An observation of much significance is contained in the following sentence:—"Referring again to Percivall's immunity of the hunter, it must not be forgotten that this animal as compared with the cart horse has the advantage of the excitement of the chase." The excitement in the hunter maintains peristaltic function in spite of a fatigue which without this stimulus sometimes leads to a temporary stasis and consequent colic.

We agree with Mr. Reeks where he insists that in many cases simple colic precedes twist of the bowels. One meets too frequently with the animal in which a series of attacks of simple colic precedes the finale of "twist" to doubt that the relationship is often ultimately one of cause and effect in the order of colic first, twist second. On the contrary, one meets with a history of a slip or a fall preceding the symptoms of abdominal pain often enough to accept the view that in some cases at least the trouble may begin with twist or strangulation.

We are sorry, for the horse's sake, that the author finds it necessary from his experience to approve so decidedly the use of eserine and pilocarpine because, although we should not dream of disputing his authoritative opinion to the extent of denying that cases may occur when these drugs are beneficial, we know that so many other people will not exercise his wise discretion, but will, on the authority of Caulton Reeks, use these drastic agents upon all and sundry occasions. We would invite the undiscriminating practitioner to pause and consider what, were he in like case with his equine patient, he would say to the medical man who proposed to administer to him a generous dose of eserine, at a moment when the pain was already as much as he could bear, more especially if that medical man could not positively assure him that his affection was not a fatal twist.

There is in the book ample recognition of the important work of Lang in his advocacy of the stomach tube and hypertonic saline solution, though the author, wisely enough, refuses to regard this or any other method as a panacea.

Considerable tribute is paid to that thorough veterinary British physiologist, Sir F. Smith, who did all that a man could do in his day, with the means at his disposal, to solve the problem of equine colic.

(*Continued from previous page.*)

journey, so that on arrival it was too decomposed for examination.

Remarks.—The horse had hunted just previous to illness and showed no signs of ill-health. Could any reader give any explanation of the abnormal enlargement of the spleen and the horse remaining in normal condition?

If there is a weak spot in the book it is found in the faith the author seems to repose in the observations of Continental veterinary writers; in this respect so far as past work is concerned it is often best to be insular: it is impossible for any experienced clinician to believe entirely in the extraordinary claims of Jelkmann as reported by Moller and Cadéac. It is true that Mr. Reeks quotes the criticism of Wallis Hoare on this matter, but it is easy to discern that he is influenced by the prestige of these Continental authorities to whose views and alleged experiences distance truly lends enchantment.

In short, Mr. Reeks is best when he is himself; his writing is clear and lucid; his style is easy; his observations are most interesting, and on this subject we may not look upon his like again. The book is well got up and printed in clear type. There are 26 chapters, two appendices, an index, and 32 good illustrations.

In these days, when the training of veterinary students in equine diseases must in some instances be suffering from a paucity of pathological material, a work of this sort, written by a man of great personal experience on a sound scientific basis, becomes indispensable for educational purposes. J. W. R.

ABSTRACTS

Bovine Mastitis.

The author gives an account of his experience in Victoria, chiefly connected with infections by *Streptococcus mastitidis*. Resulting from some 20,000 mixed milk samples in the Metropolitan area of Melbourne, he claims, by combining with the cytological picture a definite morphology of certain streptococci, to have been able to locate mastitis on hundreds of dairy farms. The morphological character alluded to is that in the chain and at right angles to it the individual cocci assume a "stroke-like" shape. A subsequent visit by the Dairy Inspector to the suspected premises detected invariably acute or chronic cases, which were usually confirmed by bacteriological examination of the affected milk.

In considering control two important recommendations are stressed. 1. Owing to the extremely infectious nature of the disease, immediate isolation of the affected case should be carried out pending correct diagnosis, the cow being milked after the normals and preferably by a different milker. 2. Detection of chronic cases. This recommendation is not so easily accomplished by the dairy farmer, since the difficulty arises when "apparent" recovery from a primary attack results. The animal now becomes a "carrier" and disease appears at subsequent puerperal periods until the quarter is completely destroyed. Bacteriological examination of every suspect should be carried out, but since on centrifuging samples the heavy sediment of catarrhal cells thrown down may show no organisms in smears, a pipette-full of sediment is incubated on an agar slope for twenty-four hours at 37°C. when in the water of condensation organisms are found retaining their typical morphology.

Treatment with vaccine was tried in a herd of forty-two affected, including twenty-six chronic cases and three mixed infections. They were divided into two lots; the first received an autogenous preparation, the second a vaccine prepared by the Commonwealth Serum Laboratory. The two agents were used in similar strength and dosage. Twenty-five days after the last dose, six showed no evidence of the existence of streptococcic mastitis; two of these had received the autogenous preparation and four of the six were amongst the few which showed a systemic reaction after the injections. The results most favourable followed the administration of vaccine immediately first symptoms were shown. The author's conclusions are that typical streptococcic mastitis does not arise through dirty conditions, but by direct or indirect infection from other cows in the herd, and introduction of affected animals. A high bacterial count, therefore, in milk from scrupulously clean dairies should immediately arouse suspicion of the existence of mastitis in the herd. The keeping quality of samples infected with *S. mastitidis* is impaired, and to the human population consuming such milk there is a potential danger.

Where dirty milking conditions existed the virulent type was usually found, and it is interesting to note that the infecting organisms mentioned are staphylococci, *B. coli communis*, *B. pyogenes*, etc.

(H. E. Albiston, M.V.Sc., Melbourne. *Journ. Australian Vet. Assoc.*, Sept., 1926). W. J. L.

Nascent Iodine in Otorrhœa.

Dr. F. Pearce Sturm, writing in the *British Medical Journal* on the above subject, states that the routine treatment of middle ear suppuration by nascent iodine, as devised and practised by him, has given better results in both acute and chronic cases than any method of equal simplicity at present available.

The method is stated to be applicable to every case and requires no skill in administration.

The method consists in the internal administration of pot. iodide, with the local application of hydrogen-peroxide drops. The resulting reaction between the absorbed salts and the applied drops liberates nascent iodine within the tissues of the middle ear cleft.

It is further stated that with variations of dosage of the active salt according to age and idiosyncrasy the treatment is useful in every case of suppurative otitis media.

G. W. D.

Safe Rat Poison Developed.

According to the *Official Record*, experiments conducted jointly by the Bureau of Biological Survey and Chemistry of the United States Department of Agriculture have shown that a powder can be made from dried red-squill bulbs, which has an efficient and uniform toxicity for rats and at the same time apparently does not unduly endanger human beings or

domestic animals. Although known for a long time, powdered red squill has never become popular on account of the fact that it tends to vary in potency. Some of the factors influencing its toxicity have been studied, and it is anticipated that they will help in the production of a stable squill product.

(*Journ. Amer. Vet. Med. Assoc.* Vol. 23. No. 2).

W. L. S.

The "Alsatian" Allegations.

Much publicity has recently been given in certain sections of the press to what is described as viciousness and treacherousness of some of the larger breeds of dogs.

These articles, which have caused much concern in the minds of the lay public, refer to what is erroneously described as the "Alsatian Wolf Hound." It is to be regretted that this breed of dog should have attached to it a name to which it can lay no claim. Alsace is not his original home, he is not crossed with a wolf and is not a hound.

The "Alsatian," to continue with this misnomer, became popular during the war and his popularity has continued to increase up to the present time. In order to meet the demand for this animal, a certain amount of in-breeding took place and all the consequences of this have such results. The "Alsatian" to-day is a highly-strung and nervous dog; he has been known for years on the Continent as the German shepherd or sheep dog, which explains the nature of the breed infinitely better than his present appellation.

Several people are reported to have been bitten by "Alsatians" and much prominence has been given to such cases. It is the fact that other breeds of dog are also responsible for this act of viciousness and one wonders how such would compare, in this respect, with the "Alsatian," were it possible to ascertain correct statistics.

It is at least unfortunate that the word "mad" has crept into the lay press in regard to this matter and it is well to remember that this is too often construed as meaning rabies, which, of course, does not exist in this country; in fact, the bite of an "Alsatian" is likely to cause no more serious results than a similar attack from any other animal.

G. W. D.

* * * *

"Some of the more excitable portions of the lay press have recently given considerable prominence to accounts of what they call viciousness or treacherousness among some of the larger breeds of dogs, and it may be of interest," says the *British Medical Journal*, "to explain what really is happening.

"Shortly after the war a breed of dog was introduced into this country from the Continent, and it immediately became popular under the very misleading name of the Alsatian wolfhound—misleading because it was not an inhabitant of Alsace, has no connexion whatever with a wolf, and it not a 'hound.' This breed of dog has been known for centuries on the Continent as the German or Continental sheep dog or shepherd dog—titles which adequately describe the dog and its function. It is very closely related to our own collie, and in pure-bred litters of 'Alsatians' pups are sometimes met with which are almost indistinguishable from a short-haired collie. Like the collie, it is a highly-strung and extremely intelligent animal, but very nervous. The sudden access of popularity immediately after the war caused very intensive breeding from insufficient stock, and with it came all the evils of inbreeding. Many breeders avoided inbreeding by the continued importation of fresh blood from abroad, but in some cases this was not done, and this is, in part at least, responsible for the recent scare. In a few cases dogs, otherwise affectionate, suddenly became mad—became, indeed, the canine equivalent of a homicidal maniac—and savaged their owners. This is liable to happen in all breeds of dogs—and, indeed, several of the recent cases were in other breeds—but the popular belief, fostered by the name, that the Alsatian was crossed with a wolf, has caused the discredit of all of these cases to be given to this breed. The treachery of a half-bred wolf differs much from the cases under notice. Though such an animal may be obedient to its master, it never has the affection of the dog (and the 'Alsatian' is 'all dog'), and its behaviour is such as to make one expect treachery if given a suitable opportunity. It is unfortunate that a pure dog should have been so unsuitably labelled; it is the more unfortunate because the wolf-like characters are really dog characters which have been less distorted by the breeder than in most of the other animals which have come under their charge.

"It is important, too, for laymen in general to understand that rabies does not now exist in this country, and that, under the very stringent conditions of quarantine imposed by the Ministry of Agriculture on all canine animals entering Britain, it is unlikely ever to gain a foothold here. The layman does not understand this, nor does he understand that a bite from a dog (even from a mad dog) which is not rabid will have little more result than a bite from any other animal. It may cause a local abscess or even more general symptoms, but it can never cause hydrophobia. The medical profession could do a considerable public service, and allay much public apprehension by giving prominence to these facts."

Central Provinces Veterinary Association.

[From a Correspondent.]

The third annual meeting and conference of the above Association was held on the 13th, 14th and 15th of November, 1926, in the grounds of the Nagpur Veterinary Dispensary, which were tastefully decorated for the occasion.

The business meeting was held on the 13th when, after a speech by the Honorary Secretary (Mr. P. S. Sundaram) in which he dealt with "Association ideals," some resolutions were passed and the office-bearers for the coming year elected.

On the 14th, Mr. C. W. Wilson, M.R.C.V.S., I.V.S., Veterinary Adviser to C.P. Government, delivered a very impressive presidential address which was attentively listened to by the delegates who were present in large numbers and who came from all parts of the Central Provinces and Berar. After a vote of thanks to Mr. Wilson, the Conference began under the Chairmanship of Major R. F. Stirling, F.R.C.V.S., D.V.S.M., I.V.S.

Many papers of considerable merit dealing with subjects of professional interest were read, and keen discussion followed each one.

Magic lantern displays of a veterinary nature and demonstrations of operations were also features of the Conference.

On the third afternoon, Mrs. R. F. Stirling was "at home" to the Association, and after an enjoyable tea, a group photograph of the members present was taken, thus bringing to a close what was a most successful meeting.

Recent Research in Foot-and-Mouth Disease.

The epizoötic of foot-and-mouth disease which has been present in this country for the past few years appears to have reached its zenith in 1923, when over a quarter of a million animals were slaughtered, at a direct cost to the country of 2¼ million sterling in compensation alone. During 1925, according to a recent report of the Ministry of Agriculture, only twenty thousand animals were slaughtered, and the compensation amounted to just over a quarter of a million sterling. Research is still continuing both here and abroad. At home there is little advance in the state of affairs previously reported in these columns. Investigations, however, have been conducted into the plurality of viruses, and the existence of two separate types (corresponding to the A and O strains of Carré and Vallée) has been confirmed in this country. Stockman and Minett[1] have investigated seventeen strains from various outbreaks in Great Britain, and find that sixteen of these were of the O type and only one of the A type. (The terms O and A were originally given by Carré and Vallée to strains collected in the Oise (O) and in Germany (A).) It has previously been suggested[2] that man might be relatively insusceptible to one of these types, and if this hypothesis can be confirmed it would serve to explain the comparatively small number of human infections in Britain. The O type seems to produce a much milder form of disease in cattle than the A type—the incubation period is longer, the lesions are less extensive, and there may even be no clinical signs of the disease. It is significant that many of the human epidemics have occurred in Germany, and it is suggested that these may be A type infections. Most of the cases recorded from this country have been very mild, compared with the sometimes fatal Continental cases, and would probably be O type infections. It has previously been suggested that these types should be referred to as aphthous and paraphthous fever. Recently, however, Waldmann and Trautwein[3] have reported the existence of a third type in Germany, and the suggested nomenclature would seem to be insufficient without the assistance of the alphabet in a manner analogous to the typhoid fevers in man. Meanwhile the American commission on this disease has visited the Continent, and has issued an interim report.[4] In horses, especially in the United States, there exists a disease called vesicular stomatitis, which clinically resembles foot-and-mouth disease very closely. The commission found that injections of material from vesicles of this disease into guinea-pigs produced lesions almost identical with those of foot-and-mouth disease in these animals; the viruses could be distinguished by cross-immunity tests, however. The commission found also that injections of this virus into cattle produced what appeared to be foot-and-mouth disease, but there was less tendency to produce vesicles on the feet than in the classical disease, and the one virus gave no immunity against the other. Pigs appear to be equally susceptible to either virus, and the lesions, both on the mouth and the feet, are indistinguishable the one from the other. Here again there is no cross-immunity. But neither do the A and O viruses of foot-and-mouth disease give any cross-immunity. The horse shows a considerable resistance to true foot-and-mouth disease (the American commission was quite unable to infect this animal experimentally), but it is very susceptible to vesicular stomatitis, lesions developing not only on the mouth but sometimes also on the feet. This appears to be the greatest difference between the two diseases, and accordingly there seems no valid reason why vesicular stomatitis should not be considered a variety of foot-and-mouth disease. The present position seems to indicate that foot-and-mouth disease, like distemper in dogs and coryza in man, is not a single disease, but a whole group of diseases with somewhat similar clinical symptoms, but producing no immunity against each other—which promises very considerably to complicate the bacteriological fight against it.—*The British Medical Journal.*

[1] *Journ. Comp. Path. and Therap.*, xxxix, p. 231.
[2] *British Medical Journal*, July 19th, 1924, p. 117.
[3] *Berl. Tier. Woch.*, xlii, p. 569.
[4] *Journ. Amer. Vet. Med. Assoc.*, lxx, p. 147.

The Control of Tuberculin.

The following letter appeared in the December 20th issue of the *Farmer and Stockbreeder*:—

Sir,—In your issue of December 6th, Major H. Peele, the Durham County Veterinary Officer, addressing the Durham Farmers' Union on the need for the control of tuberculin, is reported to have said:—"We are up against some of the large breed societies on the point"; and he goes on to urge that tuberculin should be controlled, that every dose issued could be accounted for.

So far as the English Guernsey Cattle Society is concerned, my council, realising the great evil of which Major Peele speaks, has always insisted that the sale and use of tuberculin should be solely in the hands of qualified veterinary surgeons, and that it should *not* be possible for any layman to purchase and use tuberculin—with results that are well-known to everyone interested in dairy cattle.

In February, 1924, acting on instructions from my council, I brought the matter very strongly before the notice of the veterinary authorities, and it is a source of satisfaction to know that the opinions expressed by my council nearly three years ago on this point are now actively working in the minds of members of the veterinary profession.

My council will, I feel sure, be only too pleased to do anything in their power to strengthen the hands of those who are seeking to bring about a proper system of control of tuberculin and its ultimate application.—I am, etc.,

ROBERT F. LING, Secretary,
English Guernsey Cattle Society.

12 Hanover Square,
London.
December 10th.

DIVISIONAL REPORT.

Scottish Metropolitan Division.*

ANNUAL MEETING AT EDINBURGH.

The Annual Meeting of the above Division was held in the Anatomy Department of the Royal (Dick) Veterinary College, on November 3rd, 1926, under the Presidency of Dr. O. Charnock Bradley.

The following gentlemen signed the attendance book:—

Members.—The President (Dr. Bradley), Messrs. Wm. Bannatyne, R. H. Connochie, J. G. Ross, John Aitken, D. S. Rabagliati, Professors Mitchell, Linton, and Greig, Messrs. W. Wallace Peggie, Wm. Anderson, W. H. W. Baird, T. Grahame, J. A. Matheson, John Taylor, Ed. G. Duncan, A. Linton Robertson, P. Wilson, John Macfarlane, Thos. P. Young (jun.), S. Robson, A. Gofton, J. Henderson, Thos. D. Connochie, and the Hon. Secretary.

Visitors.—Messrs. Geo. D. Munro, John Brown, Jas. R. Baillie, A. MacCallum (of the Board of Agriculture), A. Brownlee, Miss Hilda Newbiggin and Miss Grace Lewis, of the Poultry Department, Edinburgh, and East of Scotland College of Agriculture, Mr. W. A. Pool and Mr. H. Preston, of the Animal Diseases Research Association, Messrs. H. M. Wilson, Neil A. MacEwan, G. B. Purvis, A. Walker, J. G. MacGregor, E. D. M. McGregor, H. Burrow, E. J. Heather, A. P. Hamilton, P. Fisher, J. McL. Laing, J. Donaldson Pottie, J. Ker, J. Sommerville, W. R. Smith, R. S. Marshall, E. G. Robertson, A. Manson Larnach, W. J. B. Robson, W. D. Macrae, R. Ewing Johnston, R. B. H. Murray, Geo. McKee, N. Dobson, A. W. Baxter, and D. Lloyd Jones.

A considerable number of Final Year and D.V.S.M. students was present as guests of the Division.

A meeting of Council preceded the General Meeting.

The Minutes of the last meeting, having been printed in the *Record*, were taken as read and were approved and signed.

Apologies for absence were received from Sir Robert Greig, Colonel Steel, Major Peddie, Major Baird, Mr. T. M. Inglis, Mrs. McIvor, Mr. Lothian and Mr. Archibald W. Baird.

A letter from the Secretary of the Victoria Veterinary Benevolent Fund, requesting that the Division would renew its subscription, was read. The Council recommended that the subscription of £2 2s. be again paid to the fund, and upon the motion of Professor LINTON, seconded by Mr. PEGGIE, this recommendation was adopted.

A letter was read from Major Peddie of Auchterhouse, intimating his desire to resign from membership of the Division. This letter had been considered previously by the Council, and they recommended that Major Peddie's resignation be accepted with sincere regret. It was decided to substantiate this decision, and the Secretary was instructed to write him accordingly.

The SECRETARY briefly reported that the number of active members of the Division was now 51, and that the accounts of the Division showed a balance in hand of £15 8s. 9d.

Mr. HENDERSON moved the reception of the report, which he considered satisfactory, and this was carried unanimously.

ELECTION OF OFFICE-BEARERS.

President.—The retiring President—Dr. O. Charnock Bradley—at the end of his valedictory remarks, nominated Professor R. G. Linton as his successor in office. He said that, as the members all knew, Professor Linton had served the Division well, at first in the capacity of Secretary, and later as a member of Council, and he desired to nominate him as the President for the session 1926-27. No other nominations were made, and Professor Linton was duly elected. In a brief speech he thanked the members for their kindness in doing him the honour of electing him their President.

The SECRETARY read the list of the members recommended by the Council for the other offices, as follows:

Vice-Presidents.—Dr. O. Charnock Bradley, Mr. W. Wallace Peggie, and Mr. John Taylor.

Secretary-Treasurer.—Mr. Wm. C. Miller.

Auditors.—Messrs. S. Robson and J. Taylor.

Members of Council.—Messrs. A. Gofton, S. Robson, John Aitken and Wm. Bannatyne.

(The representatives to the Council of the N.V.M.A. fall to be elected at the next meeting).

The above gentlemen were unanimously elected for the Session 1926-27.

Nominations for Membership.—The following gentlemen were nominated for membership, election to take place at the next meeting: Mr. W. A. Pool, Director of the Animal Diseases Research Association; Mr. A. R. C. Bowie, St. Andrews; Mr. H. M. Wilson, Cupar-Fife; Mr. H. Begg, Hamilton; Mr. G. A. M. Harle, Coldstream; Mr. P. Fisher, Lochgelly; Mr. J. Somerville, Dunbar; Mr. Jas. R. Baillie, Cupar-Fife; Mr. W. Smith, Breechin; Mr. W. Ker, Peebles; Mr. Geo. D. Munro, Ministry of Agriculture.

Dr. BRADLEY than introduced Mr. J. P. Rice, of the Animal Diseases Division, Northern Ireland, whose paper on "Poultry Diseases—An Urgent Veterinary Problem," had been printed and circulated to the members previous to the meeting. [Paper and discussion are published separately in this issue.—Ed.].

At the close of the discussion, Mr. RICE replied to the questions raised, and Mr. W. A. POOL proposed a vote of thanks to Mr. Rice, which was heartily accorded.

The meeting then proceeded to the consideration of certain specimens which had been on view in the Pathological and Anatomical Laboratories previous to the meeting. Professor Matheson and Mr. Rice together showed a collection of specimens illustrative of the commoner diseases of poultry; Dr. Bradley and Mr. Grahame gave a demonstration of the his-

(*Continued at foot of first column next page.*)

* Received on December 5th, 1926.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Jan. 11th—Meeting of the North Midland Division at Sheffield.

Jan. 11th—Meeting of the Derbyshire Division at Derby.

Jan. 13th—Meeting of the Central Division at 10 Red Lion Square, W.C.1.

Jan. 19th—Meeting of the West of Scotland Division at Glasgow.

Jan. 21st—Meeting of the Mid-West and South Wales Division, at Bristol.

Jan. 26th—Meeting of the Scottish Metropolitan Division at the Anatomy Lecture Theatre of the Royal (Dick) Veterinary College.

London University Examiners.

The *London University Gazette* of 29th December, 1926, contained the following announcement:—

The following have been appointed to act as Examiners for the Intermediate and Final Examinations in Veterinary Science for Internal and External Students in 1927:—

Veterinary Anatomy.—J. McCunn (R. Vet. Coll.) (Chairman); and the External Examiner.

Veterinary Physiology.—W. L. Symes (St. Thos. H.M.S. and R. Vet. Coll.) (Chairman); and the External Examiner.

Veterinary Hygiene.—G. H. Wooldridge (R. Vet. Coll.) (Chairman); and the External Examiner.

Veterinary Pathology.—Sir John M'Fadyean (R. Vet. Coll.) (Chairman); and the External Examiner.

Research Work at Cardiff University College.

Summaries of reports issued by the Advisory and Research Department in Agriculture of the Cardiff University College reveal the variety and sound results of experiments carried out during the past year.

There was a great increase in the number of requests for advice on problems connected with the health of live stock, nearly 300 inquiries having been dealt with.

"Black-head" in turkeys had been more prevalent than usual during the year, and several outbreaks had been dealt with successfully. There had also been several outbreaks of bacterial diseases in fowls, for which vaccination was being tried. Stomach worms in sheep had been the cause of considerable losses over quite a large area in Monmouthshire. Treatment by means of copper sulphate had proved satisfactory in dealing with the problem.

Over 1,600 sheep were inoculated against braxy, *i.e.*, the disease characterised by sudden death, usually after a frosty night. A considerable number of apparently barren cows had been treated successfully by the method of Professor Nielsen.

The "Diary of the Editor of the *Daily Express*" contains the following interesting entry in a recent issue, in the column devoted to "London in 1901":—

The Hanoverian Creams.

"*December 14th.*—Captain Nicholas, who is in charge of the royal mews at Buckingham Palace, showed me over the place. The long line of loose boxes, filled with the famous Hanoverian creams which draw the state carriages, made a most impressive spectacle. The horses are tended with great care, and are exercised daily by the small regiment of grooms who are employed at the mews all the year round. The creams trace their ancestry to the first four that were brought over from Hanover by King George I., and no other breed has been employed in state processions.

"'What about the automobile;' I asked Captain Nicholas.

"'Not a chance,' he replied. 'These creams will be employed by the Kings of England so long as there are kings.' (The creams are no longer in the mews. 1926)."

Milk Analysis Certificates.

A circular issued by the Ministry of Health to Sale of Food and Drugs Act Authorities in England and Wales directs attention to the Public Health (Milk and Cream) Regulations and their administration. It is pointed out that a few public analysts, in reporting on a sample of milk which is found to be deficient both in milk fat and in other milk solids, word their certificates in such a way as to imply that the double offence of the abstraction of fat and the addition of water has been committed, whatever the relative degrees of the two deficiencies.

After consultation with the Society of Public Analysts, the Minister of Health recommends that in such a case the certificate forwarded should be so worded as to show how much, if any, of the deficiency of milk fat is presumed to be due to abstraction, allowance being made for the effect of the added water. A memorandum is enclosed with the circular embodying in a revised form the procedure to be adopted by local authorities and their officers in the administration of the Sale of Food and Drugs Acts.

One-sided Wildness!

"Supposing you have a lot of cats squalling about your house at night. Is it an offence to trap them?"

This question was put by the Lord Chief Justice of Northern Ireland in the Divisional Court to the Attorney-General, in the course of an appeal arising from the trapping of a cat.

The Attorney-General replied that it was an offence, because cats were domestic animals.

The Judge also inquired if it was considered an offence to trap stray cats which were a nuisance. Counsel contended that it was so.

*** Two Judges of the High Court in London decided a year ago that the cat is not a wild animal. Cats, said Mr. Justice Shearman, are classified in law among domestic animals, and the owner is not responsible for the malicious damage they do unless he knows of a special evil characteristic acquired.—*The Daily Express.*

Erratum.

In Mr. G. N. Gould's "Unusual Case," published in our issue of December 25th, 1926 (p. 1149), lines 33 and 34 of column two should read: "at least one circuit through its length of the thickness of the reticular wall . . . ."

(Continued from previous page.)

tology and physiology of the oviduct; preparations to illustrate caponisation of cockerels were arranged by Mr. Miller, and there was a number of interesting medical and surgical specimens, arranged by Mr. Mitchell, also on view. These latter were discussed in some detail by the members, and a report will appear later, with photographs.

A vote of thanks to Professor Mitchell was proposed by Dr. Bradley and heartily carried, and a cordial vote of thanks to Dr. Bradley, also heartily carried, concluded the proceedings of a very successful meeting.

Wm. C. Miller, *Hon. Secretary.*

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

"A Pulmonary Problem."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Having read the symptoms detailed by Mr. H. L. Jones in the above clinical report, I should quite confidently diagnose the cause of death as syncope, following on traumatic pericarditis consequent on progressive puncture of the wall of the reticulum, the diaphragm and the pericardial sac by a foreign body, such as a piece of wire or a lady's hat-pin. If I am correct, however, the case presents an unusual feature in that one would hardly expect to find subcutaneous emphysema but rather œdema—especially in the region of the dewlap.

However, given puncture of the diaphragm, as surmised by me, I suppose there is always the possibility of leakage of air from the chest cavity, as from a leaking bellows. I shall read the *denouement* with interest.—Yours faithfully, F. W. CHAMBERLAIN.

Cheam,
Sutton, Surrey.
1*st January*, 1927.

"A Contribution to the Study of Narcotism."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I enclose a cutting from the *Daily Express* of January 1st, which is oddly relevant to most of the subject matter in the article which appeared in your issue of December 18th. It seems to show that medical and veterinary thought are working on parallel lines in the most unexpected fields of scientific enquiry.

In his letter published in your issue of January 1st, Sir F. Smith gives, I believe, the key to the problem where he suggests that a specific glandular secretion is the cause of purgation in excitable animals. The matter may, perhaps, be summed up in the following formula:—*In addition to the reflex stimulus provided by the presence of fæces in the rectum which is in abeyance in cases of intestinal stasis, evacuation is naturally effected by the glandular secretion of a specific peristaltic agent, of which the production is influenced by physical excitement and tobacco smoke inhalation.* It should be possible ultimately for physiological investigators to determine the source and identity of this substance. It may be an endocrine secretion; it may be secreted in the bile, or by the mucous glands of the large intestine; it may be an internal secretion of the latter glands. Personally I believe that these glands are chiefly concerned because it is demonstrable that tobacco smoke inhalation increases their ordinary secretion of mucus.

In the isolation of the specific substance and its production commercially, or its imitation synthetically, rests a possibility that chemists will some day produce a satisfactory laxative drug. The fact that it is only, or chiefly, the first smoke of the day which influences peristalsis seems to justify the assumption that tobacco smoke inhalation, like physical excitement, acts by releasing an active principle that, during rest, has become stored up in some glandular tissue.—Yours faithfully, J. W. RAINEY.

34 Chester Terrace,
Regent's Park.
3*rd January*, 1927.

Our correspondent's enclosure is as follows:—

"PHYSICAL BENEFITS OF MODERATE SMOKING."

"'Speaking generally, smoking in moderation is not injurious to grown-up people; on the contrary, it exercises a soothing influence when the nervous system is irritable,' declares Sir Robert Armstrong-Jones, the Lord Chancellor's Visitor in Lunacy, contributing to a symposium in this month's *Practitioner*.

"Sir Humphrey Rolleston says: 'The mildly laxative effect of tobacco in seasoned smokers may be offered as an excuse for a pipe after breakfast.'"

Sewage Poisoning and Johne's Disease.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In the trial of the sewage poisoning of cattle case recently heard in the Chancery Court, and reported in the *Record*, it was stated by both veterinary surgeons for the plaintiff that the difference between the sewage poisoning and Johne's disease was that the former was a gastro-muco-enteritis of a typhoid type, due to coliform organisms, whereas the latter was a chronic interstitial enteritis. I have often seen swelling of the V-shaped space of the lower jaw in scouring cows and in these cases the condition was due, in my opinion, to the debility caused by Johne's disease.—Yours faithfully R. MURRAY.

12 Church Street,
Rugeley,
Stafford.
January 4th, 1927.

The Editor acknowledges the receipt of the following:—

Report of a meeting of the North of England Division, from Mr. J. R. Rider, Hon. Secretary.

Report of a meeting of the Southern Counties' Division, from Mr. J. Facer, Hon. Secretary.

Communications from Mr. T. F. Prime, Lieut.-Col. T. D. Young.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.

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—WILLIAM HUNTING—OUR FOUNDER—*Veterinary Record*, July, 1888.

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